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The Mines and Works of the Lehigh Zinc Company.*

I.—THE MINES.

THE first discovery of zinc on the property now worked by this company was made by the celebrated mineralogist, Prof. WM. THEODORE ROEPPER, in 1845. Different claimants kept the property in continual litigation till 1861, when everything was satisfactorily settled by the purchase of the land by the company who have worked it ever since.

The mines are situated in a valley, four miles south of Bethlehem, Pa., in Lehigh county. The valley is from two to three miles broad and is bounded on the north and south by syenitic hills. Syenite underlies the valley and upon this is deposited the Potsdam sandstone, then a layer of slate, and finally, a dolomitic limestone, belonging to the Chazy or Black river formation, in which the zinc deposits are inclosed. The rocks occur in folds, and have evidently been subjected to tremendous pressure from below, the zinc deposit being found in an anticlinal axis, in nearly vertical veins. It is supposed that the zinc was originally disseminated, through the dolomite, in the form of carbonate or sulphide. This ore, it is supposed, was dissolved by the carbonic-acid water which, at the same time, eroded the limestone. The sulphuric acid, resulting from the decomposition of iron pyrites, converted the zinc into the form of sulphate of zinc, and from this, by the action of the animal matter contained in limestone, the zinc was precipitated as sulphide (blende), which is therefore the primary ore of the present zinc deposits. The silicates and carbonates at present found, are doubtless formed by the action of air and water upon the original deposits. The presence of zinc, disseminated through the dolomite of the valley can easily be found.

The general strike of the stratified rocks of the valley is N. E. and S. W., but the most important zinc veins run east and west.

The blende usually found in these mines is of a very peculiar texture and appearance, resembling closely the limestone in which it occurs. The cleavage has a waxy lustre, and the ore is a massive blende containing from four to five per cent. of iron. Occasionally small crystals are found, but the crystalized "black-jack" of other mines is not found here. Smithsonite and calamine are also found. An earthy variety of the former mineral, of a light yellow or brown color, is abundant as an ore; and the latter, mixed with decomposed rock, clay, etc., forms one of the principal surface ores.

A compact clay, containing from 26-32 per cent. of zinc, unctuous and with an eminently conchoidal fracture, is believed by Prof. RÖPPER to be a true mineral. Greenockite occurs as a yellow coating on the blende. Goslarite, pyrite, wad, melanterite, calcite, and other minerals are also present.

The mines were originally worked as open cuts, commencing at the outcrop, found by Prof. RÖPPER. The ore was easily and cheaply extracted so long as it was possible to pursue this system. From twelve to fifteen thousand tons per year were taken out in this way at a cost of about a dollar per ton. At present the cost of mining a ton of blende is $6, and a ton of earthy ore $12. About twenty thousand tons of both sorts are mined per year.

* Abstract of a paper, by Mr. H. S. DRINKER, read before the American Institute of Mining Engineers, August 16th, 1871.

PUMPING.

The chief difficulty encountered in working these mines is the large amount of water which must be kept under control. In 1854 the open cut of the Ueberroth mine, twenty feet deep, was drained by centrifugal pumps, which were subsequently replaced by a double-acting pump, capable of raising 200 gallons per minute, from a depth of 40 feet. In 1861 a Woodward pump, now in use at the smelting works of the company, was put up. This was, however, too small to do the work, and in 1863 a Corliss engine, driving four centrifugal pumps, capable of pumping about 2,500 gallons per minute, was put up. In 1866 the West engine, still in use, and capable of pumping 5,700 gallons per minute, with 16 strokes, was erected, and the same year the shaft was sunk to a depth of 132 feet. The centrifugal pumps have since been removed, as the loss by friction was found to be 47 per cent.

THE WEST ENGINE

was designed and erected by Mr. JOHN WEST, the engineer of the company, under whose direction the colossal engine, for the new main pumping shaft, has since been built and is now being erected. The first West engine erected was of 300 horse power, and worked three 22 inch lift-pumps, at the rate of 16 strokes per minute. The engine is a horizontal, condensing, double-acting engine, and besides the three lifting pumps, also drives a small 12-inch lifting pump which raises water for condensing and ore-washing, from the adit level, about 45 feet.

A single-acting

BULL ENGINE,

on the Cornish principle, with a fifty-inch steam cylinder and ten-foot stroke, designed by Mr. WEST more than twenty years ago, is supposed to be the first Cornish engine ever built in this country. It was moved to these mines, and is still in use. It works a twenty-two inch pump at 7½ strokes per minute, raising a column of water 160 feet to an upper adit. The capacity of this pump is about 1800 gallons per minute.

A twenty horse-power engine, raising from 230 to 240 gallons per minute, is at work at another shaft.

THE NEW PUMPING ENGINE,

of which so much has been said, was also designed by Mr. WEST. It is expected to be in working order before the end of the year. It was built by MERRICK & SONS, Southwark Foundry, Philadelphia; much of the casting being sub-contracted for by LAZELL, PERKINS & Co., of Bridgewater, Massachusetts.

The steam is to be supplied by sixteen boilers, each 50 feet long, 36 inches in diameter, and built of 5-16ths iron.

Balanced valves 20 inches in diameter and with 1¾-inch lift, are used to admit steam to the cylinder, which is of cast-iron, 110 inches in diameter and 10 feet stroke, and weighs 30,398 lbs. The cylinder bottom weighs 26,798 lbs., and the head 24,540 lbs., making the total weight of the cylinder and heads 81,736 lbs., or 40 net tons. The cylinder jacket is of cast-iron, 1⅛ inches thick, and weighs 26,928 lbs. A space of ½ inch is left between the cylinder and jacket, the latter being lagged with well-seasoned wood. The exhaust valves are 30 inches in diameter and lift 3 inches.

The condenser is situated directly beneath the cylinder, and a channel-way leads from it to the air-pump. The condenser and bonnet weigh 33,075 lbs., and the bottom 24,213 lbs., making a total of 57,288 lbs. The piston-rod is of wrought-iron, 14 inches in diameter and 22 feet long. The cross-head weighs 15,740 lbs., and is fastened to the piston-rod by a nut weighing 1100 lbs. A parallel motion is employed to keep the piston-rod vertical.

The working-beam is in four parts, lattice patterned, and weighs in all 95 net tons.

The connecting-rods run from the working-beam to the fly-wheels, and are 41 feet 2½ inches from centre to centre, and 15 inches in diameter in the middle. They weigh over 16,250 lbs. each. There are two fly-wheels, one on each side of the cylinder, each of which is 30 feet in diameter, and weighs, with weights bolted in, about 92 tons. The pump rods are attached to the other end of the working-beams by back and centres, running through its four parts. One of these centres weighs 2374 lbs.

There are two wooden main pump-rods, 2 feet by 3, made of six pieces of 1 foot square Georgia pine lumber. The bucket-rods and the plunger-stockings are attached to them by means of set-offs, and a plunger-head.

There are to be four lift-pumps of 31½ inches in diameter, discharging into four tanks, resting on bearers, 96½ feet from the surface. Four plunger pumps force the water from the tanks to the surface. As the shaft is carried down, the lifting pumps will not be required to raise the water more than 100 feet. A fifth plunger and a fifth lifting cylinder will be provided, so that the work of lowering the pumps, as the deepening of the shaft will render necessary from time to time, will be much shortened in time, and seven of the eight pumps can be kept almost continually in operation. The engine can be run under a pressure of 60 lbs. to the inch, and would then exert nearly 3000 horse-power. It is, however, not intended to run at so high a pressure, but it is intended that the engine shall pump 17,000 gallons of water per minute from a depth of 300 feet. All the larger parts of the engine are made to resist a strain eight times greater than it is calculated they will ever be called upon to sustain.

TOTAL AMOUNT OF WATER TO BE PUMPED.

The following summary may be interesting as showing the total pumping capacity of all the pumps about the mines:

The new Engine	.....	17,000	gallons	per minute.
The West "	.....	5,700	"	" "
The Bull "	.....	1,800	"	" "
The small "	.....	235	"	" "
Total	.....	24,735	"	" "

or 35,618,400 gallons per day.

TO BE CONTINUED.

Professional Morality.

By RICHARD P. ROTHWELL, M. E.

Read before the American Institute of Mining Engineers, August 17th.

MINING engineering, the most responsible and most practically useful of the learned professions, being as yet in its infancy in this country, is just now beginning to attract the attention it deserves, and it is only by the united action of the craft speaking through such an organization as our American Institute of Mining Engineers, that we can hope to adopt a code of professional morality which will elevate the standing of engineers, and prevent the abuses that greater opportunity render probably more common in our profession than in any other.

There is no other kind of commercial enterprise where so much is confided to the knowledge and fidelity of a single, or, at most, of a few individuals, as in mining investments, for there is no other enterprise where capital is invested so blindly, with so much faith, and so little knowledge, as in mining. Many millions are annually paid in this country for mineral property, on the testimony of one, or, at most, a few experts; how important then is it that these experts should be mining engineers (none other is really an expert in questions of the value of mineral property), men of great experience, clear and sound judgment, honest and honorable—who are not only capable of judging rightly of the many things which will affect the value of a property, but who will express the facts without fear or favor, stating not alone the truth, but the *whole truth*. It is so easy, without saying anything absolutely untrue, to color facts so as to bring all the advantages out into relief, while the disadvantages are hidden away in shadow, or so slightly mentioned that they appear, to the uninitiated, as of little consequence, that it is scarcely to be wondered at that advantage should be taken of it, and that not alone by the professional quack or charlatan whose self-assurance stands in lieu of knowledge, and whose chief care appears to be to make his report as favorable as possible; but by the still more dangerous, good-natured, honest man, who desires out of pure generosity and good nature to benefit his friend or employer, by saying all he can in favor of, and as little as possible against the property he has been called on to examine and report on as an expert. He appears to think that he would not be acting right if he were to report facts which would prove injurious to his employer's interests. This report is handed to capitalists; they say, "Mr. SMITH is well known to be an honest, upright man; he would not say what is not true; he is also an experienced engineer, and should know the value of a property." They consequently pay a large price for the land, organize a company with an enormous capital, and commence improvements, houses, machinery, etc., etc., on the largest and most expensive scale, and find out, only too late, that, while all Mr. SMITH had said was true, it was not the whole story, but the other side which was known to him and withheld, modified the question very materially, and had they known it in its true bearing, they would not have paid one-half as much for the property, or have made improvements one quarter as expensive. The concern finally sinks under the weight of excessive capital invested, and when you invite any of these victims to again join in a mining investment, however good, they answer, with a shake of the head, "No, no; we know all about it; we don't want any excellent mineral property, but will put our money into something safer, and more profitable."

There is no engineer practically familiar with mining who cannot recall to mind numbers of mineral properties where enormous sums of money have been invested on reports so grossly exaggerated or inaccurate as to convince us that the writer was either totally ignorant of the profession whose title he assumes, or that he knowingly misrepresented facts, a supposition but too often confirmed; and there is no more fruitful cause for the disrepute in which mining enterprises are frequently, and sometimes deservedly, held, than the wild exaggerations and one-sided or *rose-colored* reports—those satires on the profession—which figure so often on the prospectuses of mining companies, and lead to expenditures altogether out of proportion to the value or actual requirements of the property. It is therefore of the first importance that a high standard of morality should be maintained in the profession, and one of the principal objects of our Institute—an object which will certainly conduce to "the more economical production of the useful minerals and metals"—is to elevate in every way the profession, to elevate the standard of professional knowledge, to elevate the standard of professional morality, by discountenancing the tricks and abuses which are unfortunately but too common in this country, and consequently to elevate the standing of the profession among those not belonging to it.

Among the most responsible duties of the mining engineer is the examination and reporting on mineral properties. The great interests involved should make him exceedingly careful in expressing his opinion. He should ascertain all the facts, noting carefully the authority on which each rests, and giving the leading facts from which his deductions are drawn, so that others can analyze his opinion (and, it may be, guided by a greater experience, may arrive at a different conclusion), for even the most experienced engineer is liable to err sometimes in his opinion. This will, of course, dispel a very attractive mystery, in which it is often sought to enshroud the opinions of experts; but, since it shows where errors of judgment belong, it tends to make the engineer more careful, and consequently reliable. The engineer should religiously guard against allowing his professional opinions to be influenced by questions of friendship or personal interest. His duty is simply to ascertain, through the medium of the greater experience and knowledge his professional training has given him, the true interpretation of established facts. You are not acting honorably with either the owner of the property or the capitalists he may wish to join him in the investment; for it is a manifest injustice to the one to leave him under a false impression of the actual value of his property, and an equal injustice to the others, who, believing in your honor and good faith, invest their money. Of course, the use of the facts you have ascertained in making your examination belongs exclusively—for a reasonable time, at least—to your employer, and you are not, therefore, at liberty to divulge or make use of them without his permission. In a general report you are called on by professional honor to state what is favorable and unfavorable alike—not only the truth, but the whole truth (of course, when you are consulted on a single point, your report goes no further), and any other course is calculated to bring deserved disgrace upon the profession, and to do a most serious injury to mining interests. To some of you I may appear more emphatic than is necessary; but I have seen, as doubtless most of you have also, very numerous examples, scores—I speak advisedly—of the manner of reporting, against which I protest, and I have seen millions of dollars lost in investments, induced by such exaggerations made over the title of "Mining Engineer," and sometimes—it may be generally—made with the best intentions, and yet producing results which are scarcely more desirable than the proverbial use to which good intentions have been generally devoted.

It may be said that "the Church is infallible, though its members are frail," and that the *profession* should not bear the sins of its members; but it does, and it should, for, if professional morality is so lax as to allow members guilty of these dishonorable practices to remain in good standing, then the blame may justly be laid on the whole profession, and outsiders may well question if the title of mining engineer is so honorable as to be desirable.

There is still another abuse to which I wish to call your attention, and against which I desire to protest—it is the *almost universal custom* among engineers in this country—yes, and our cousins in England are by no means exempt from the charge—of giving and accepting commissions while acting professionally.

There should be some recognized standard as to the duties of engineers in carrying out work. We hear constantly the argument advanced, that an engineer is justified in accepting a commission on material furnished, provided his so doing does not increase the cost of the same to his employers. They say, "The manufacturer employs agents for disposing of his goods; he pays them by commissions on the sales which are made, at regular fixed rates; he is willing to make the engineer his agent, and allow him the commissions he allows his other agents. The engineer's employer does not lose thereby, for he could not himself buy the goods at less than the regular prices which cover the commission."

This is the argument advanced to justify the course so generally followed; and though there is certainly nothing unprofessional in an engineer acting as agent for manufacturers, and receiving compensation in the form of commissions for his services, yet it appears to me, that a strictly honorable course requires that the engineer should give his employer the benefit of such discount as he can obtain on work where he is engaged professionally. Your employer—individual or corporation—in paying you for your services as engineer, has just as much right to the benefit of your knowledge of the trade and the advantages to be derived from your position—in which are included discounts you can obtain—as he has to the professional skill and knowledge which enables you to design and execute a given piece of work, in a better or more economical manner than if he had not acquired this knowledge at the expense of a large outlay in money and labor. The engineer is assuredly entitled to the best terms he can obtain. And the fact that an engineer can execute work at a reduction from usual prices, is a reason for placing the work under his direction. And I consider the engineer who receives, or allows to be received by any one else, commissions on the material employed in his works, is not acting honestly or honorably, and should be deemed unworthy the honor and dignity of our profession.

Which of you but knows numbers of cases where superintendents of works, some of them using the name of engineers, are receiving from five to sixty per cent. commission on all material furnished and on contracts given by them. With one it may be in the sinking of a shaft; the contractor receives a figure thirty per cent. more than the work can be done for, and divides this with those giving the contract, defrauding the employer of just that amount. With another, it may be the furnishing machinery or supplies to the mines; the invoices are made out at either regular prices or even above them, and the purchasing agent or some one connected with the concern receives from ten to fifty per cent. commission. With another, it may be a bridge is to be built; tenders are received and the contract awarded—not to the lowest or best tender, but to him who is willing to pay the most to those having the disposition of the work.

To such a point has this disgraceful practice come, that, I speak advisedly when I say that there is scarcely an important piece of engineering work executed in this country where commissions are not paid to some one for influencing the granting of the contracts.

This is so notorious, and has become so common, that you will find not a few engineers who even defend it. It is simply swindling your employers, and should be condemned by every honest man.

There is no profession where opportunity and temptation to be dishonest are more frequent than in mining. The employer seldom knows the value of the work being done, and the interests involved are enormous; and there is no profession where the responsibility and consequent honor for the faithful discharge of duties is so great. The mining engineer, in addition to possessing extensive professional

knowledge, sober, impartial and penetrating judgment of facts and men, should be the very soul of honor, constantly bearing in mind that not only his own honor but that of the profession are involved in his actions. The enormous interests affected by his opinion should make him exceedingly careful in expressing it, and, at the same time, he should not hesitate, when called upon to do so, to state his opinions with perfect fairness, and unaffected by personal considerations of any kind whatever.

In all matters, the mining engineer, more than all men, should cultivate those habits of strict accuracy, perfect faith and that high-toned standard of honor which is the essential characteristic of a gentleman, and should be equally the recognized character of the members of our profession.

Preliminary Report of the Committee upon the Waste of Anthracite Coal.*

AT the first meeting of the Institute, a paper was read by Mr. ROTHWELL, calling attention to the importance of at once considering the great waste of anthracite coal under the present system of mining and preparing that fuel for market, and the undersigned were appointed a committee to examine and report upon the method now in use.

About the time the committee were selected, a general resumption of work, after the long strike, took place in the coal region., and the members of the committee have not in consequence had as much leisure to devote to the study of the question as its importance demands.

In the present preliminary report we shall merely sketch out the plan which we propose to pursue in our investigations, so that when our fellow members are called upon to assist us in our work by furnishing statistics, etc., they may understand more clearly for what object our inquiries will be made.

As one of the most practicable methods of obtaining the information requisite for an intelligent consideration of our subject, we propose to send, from time to time, to members and others interested in the mining of anthracite coal, printed sets of questions relating to points under consideration. We would here impress upon our fellow members the importance of filling up these papers as far as they can from their own knowledge. We would, of course, wish each question to be answered as fully as possible, but we do not expect every one to answer them all. One question well answered would be of more use to us than the whole paper filled up with answers, many of which are mere guesses. We propose to consider our subject under three heads, viz.:

I. The waste of coal in mining.

II. The waste of coal in preparing it for market.

III. The waste of coal in transporting it to market.

I. *The waste of coal in mining.*—This question may be considered from two points of view. We propose first to examine the various methods employed, both in this country and in Europe, for working veins of the size of those most common in our anthracite coal fields, with a view of determining the waste and the cost of getting the coal under each system.

The various methods of working thick veins now in use in England, France and Germany, such as the Staffordshire "Square Work," the French "Methode par remblais," and the Silesian method of drawing down the roof, and the long wall system for veins of moderate thickness, are particularly worthy of notice. The object of this investigation will be to determine the best method which can be practically employed in Pennsylvania for mining anthracite. Should it be found that the existing system is the best, or, at least, that it is likely to remain the usual one, we shall then take up the second portion of this division of our subject, which is, to make a careful and thorough examination of the present system of mining anthracite with a view of suggesting any modifications by which the expenses of mining or the waste may be diminished. The committee hope to be aided in this portion of their work by all those practically engaged in mining anthracite. These two subdivisions constitute the most important, and perhaps, strictly speaking, the only questions referred to us, but the committee feel that the report would be incomplete were the two other divisions of the subject, viz., the waste in preparing the coal and the waste in transporting it to market, left unnoticed. In treating these questions, we shall follow the same general plan as in the case of the "waste in mining."

II. *The waste in preparing coal for market.*—We propose first to consider the present manner of preparing anthracite coal for market in comparison with the methods adopted for other coals in other places, It is important to determine how far it would be possible to do away with the use of breakers, at least so far as the crushing is concerned, so that the coal may be shipped nearly as it comes from the mines, the only preparation besides the removal of the slate being a separation into three or more sizes. It would be very desirable to determine how much inducement (in a diminution of prices) could be offered to consumers to take their coal with less preparation. For example, a large manufactory now using broken and egg might be willing to take the run of the mine with the lump, steamboat, and the coal which would pass between bars placed one inch apart, taken out, provided they could obtain it at a less price. Another might use the large coal instead of the prepared sizes. In other words, can we teach the community that it is their interest to use the coal as it comes from the mine, by showing that the waste must be paid for by them?

The second portion of this division of our subject would consist of a discussion of our present system of preparing coal for market, with a view of diminishing both the expense of preparation and the waste. Under this head would come the consideration of the best form of breaker, of slate pickers, of screens, self-dumps, etc.; and of the best methods of using the slack or fine coal. The committee would here call attention to the importance of so arranging the breakers that the coal will not be allowed to drop, but always to slide when it is necessary to convey it from one level to another, sliding causing much less waste of coal.

The third division of our subject belongs more properly to civil than to mining engineering, but there are some points to which it would be well to call attention.

III. *The waste in transporting coal to market.*—We shall begin the consideration of this question by discussing the means adopted in various parts of the world for transporting large quantities of coal by railroad, canal and sea, and by comparing them with those adopted here, with a view of determining the best method of moving coal to market. Under this head would come the consideration of the drops used at Newcastle for transferring the coal from cars to vessels, the use of steam colliers, and the use of machinery for unloading vessels. We will then discuss our present system, and endeavor to point out any improvements in the method of handling the coal, by which the expense and waste could be diminished.

One point to which the committee would here call attention is the great waste of coal occasioned by the variable height of the cars used for transporting it. When constructing a breaker at present, it is necessary to place the lips of the shoots and pockets so far above the railroad track, that not only the highest car in use at the time, but also any one likely to be built will have room enough to pass under them. The cars at present in use vary much in height, and many are provided with brakes which project from six inches to a foot above the rest of the car. In consequence, the coal is obliged to fall several feet from the lip of the shoots, causing considerable waste by breakage, and damaging the cars.

It would be very advantageous if the railroad companies would adopt a uniform height for the car, which should be as small as possible (measured from the bottom of the car), would avoid the use of projecting brakes, and would compel operators, when constructing their breakers, to bring the lips of the pockets as low as possible. The members of the committee hope, with the aid of their fellow-members, to carry out the above programme, and to throw some light upon the important subject of the waste of anthracite coal.

E. B. COXE,
T. S. MCNAIR,
DANIEL HOFFMAN,
E. GAUJOT,
R. P. ROTHWELL,
W. B. HICK,
} Committee.

* Read before the American Institute of Mining Engineers, August 15, 1871.

Protoplasmic Life.

OVER a year ago, Prof. JOHN TYNDALL, the celebrated English physicist, delivered a lecture before the Royal Institution of Great Britain on smoke, dust and haze. By means of brilliant experiments, he proved the existence of a large number of particles of organic and inorganic matter suspended in the air. These organic germs in the air, he thought, occasioned the phenomena which had led Dr. BASTIAN and others to the adoption of the hypothesis of spontaneous generation. The lecturer showed how these germs could be almost, if not entirely, excluded by the very simple device of filtering the air through cotton wool.

Now let us examine the practical application of this purely scientific discovery. It is pretty well established, that many, if not all the diseases known as contagious are propagated by means of small germs, carried about by the air. These germs, when received in a liquid or upon a tissue, will, under favorable conditions, multiply with the most astonishing rapidity. If, under favorable conditions, a human being inhales the virus, or the germs, which propagate small-pox or typhoid fever, these germs will reproduce themselves to such an extent that he will be attacked by the corresponding disease. It may be asked, of what practical value would be the establishment or the disproval of the theory of spontaneous generation, in this connection? According to this theory, these germs would be spontaneously developed in those afflicted with the disease, but according to the germ theory, which we previously stated, they would be wafted to him from without. In this connection, Prof, TYNDALL uses the following language:

"And here you see the bearing of the doctrine of spontaneous generation upon this question. For if the doctrine continues to be discredited as it has hitherto been, it will follow that the epidemics which spread havoc amongst us from time to time are not spontaneously generated, but that they arise from an ancestral stock whose habitat is the human body itself. It is not on bad air or foul drains that the attention of the physician will primarily be fixed, but upon disease germs which no bad air or foul drains can create, but which may be pushed by foul air into virulent energy of reproduction. You may think I am treading on dangerous ground—that I am putting forth views that may interfere with salutary practice. No such thing. If you wish to learn the impotence of medical science and practice in dealing with contagious diseases, you have only to refer to a recent Harveian oration by Dr. GULL. Such diseases defy the physician. They must burn themselves out. And indeed this, though I do not specially insist upon it, would favor the idea of their vital origin. For if the seeds of contagious disease be themselves living things, it will be difficult to destroy either them or their progeny without involving their living habitat in the same destruction. * * * *

"Once, then, established within the body, this evil form of life, if you will allow me to call it so, must run its course. Medicine as yet is powerless to arrest its progress, and the great point to be aimed at is to prevent its access to the body. It was with this thought in my mind that I ventured to recommend, more than a year ago, the use of cotton-wool respirators in infectious places. I would here repeat my belief in their efficacy if properly constructed. But I do not wish to prejudice the use of these respirators in the minds of its opponents by connecting them indissolubly with the germ theory. There are too many trades in England where life is shortened, and rendered miserable by the introduc-

tion of matters into the lungs which might be kept out of them. Dr. GREENHOW has shown the stony grit deposited in the lungs of stone-cutters. The black lungs of colliers is another case in point. In fact, a hundred obvious cases might be cited, and others that are not obvious might be added to them. We should not, for example, think that printing implied labors where the use of cotton-wool respirators might come into play; but I am told that the dust arising from the sorting of the type is very destructive of health. I went some time ago into a manufactory in one of our large towns, where iron vessels are enamelled by coating them with a mineral powder, and subjecting them to a heat sufficient to fuse the powder. The organization of the establishment was excellent, and one thing only was needed to make it faultless. In a large room a number of women were engaged covering the vessels. The air was laden with the fine dust, and their faces appeared as white and bloodless as the powder with which they worked. By the use of cotton-wool respirators, these women might be caused to breathe air more free from suspended matter than that of the open street. Over a year ago, I was written to by a Lancashire seedsman, who stated that during the seed season of each year his men suffered horribly from irritation and fever, so that many of them left his service. He asked me could I help him, and I gave him my advice. At the conclusion of the season this year, he wrote to me that he had simply folded a little cotton-wool in muslin, and tied it in front of the mouth; that he had passed through the season in comfort, and without a single complaint from one of his men.

Thus we see one practical application of this theory, calculated to be of immense benefit to the human race.

Another practical test to which this theory has been applied is to enable firemen to penetrate into any portion of a burning building, where they will not be scorched by the heat, regardless of the smoke.

Smoke is rendered visible by the small particles of color which it contains, and the supposition was that these small particles so irritated the throat and lungs of the person who inhaled the smoke as to render him unable to continue the operation for any length of time. The cotton-wool respirator was again brought into requisition, and it was found that by its use a man could, for several minutes, inhale an atmosphere otherwise unendurable. But as, after a few minutes, one would be forced to retire from the smoke, even when the respirator was used, Professor TYNDALL concluded that there must be an irritating cause, most probably hydro-carbon vapors, resulting from the very imperfect combustion which must attend the production of dense smoke. He therefore bethought himself of the property possessed by all bodies, to a greater or less extent, of condensing gases and vapors upon their surfaces. When the condensing body is very porous, or in a fine state of division, the force of condensation may produce very remarkable effects. Thus, a clean piece of platinum foil placed in a mixture of oxygen and hydrogen so squeezes the gases together as to cause them to combine; and if the experiment be made with care, the heat of combination may raise the platinum to bright redness, so as to cause the remainder of the mixture to explode. The promptness of this action is greatly augmented by reducing the platinum to a state of fine division. A pellet of "spongy platinum," for instance, plunged into a mixture of oxygen and hydrogen, causes the gases to explode instantly. In virtue of its extreme porosity, a similar power is possessed by charcoal. It is not strong enough to cause the oxygen and hydrogen to combine like the spongy platinum, but it so squeezes the more condensable vapors, and also acts with such condensing power upon the oxygen of the air, as to bring both within the combining distance, thus enabling the oxygen to attack and destroy the vapors in the pores of the charcoal. In this way effluvia of all kinds may be virtually burnt up; and this is the principle of the excellent charcoal respirators invented by Dr. STENHOUSE. Armed with one of these, you may go into the foulest-smelling places without having your nose offended.

A respirator, containing pieces of charcoal, was therefore attached to the previously described wool respirator, and it was found to absorb the irritating gases which passed through the wool. The charcoal alone would also be insufficient, as it would not stop the small carbon particles. The combination of the two, however, acted so perfectly that a man could remain in a room filled with the very densest smoke for an indefinite period.

The apparatus was carefully and thoroughly tested by Captain SHAW, of the London Fire Department, who is enthusiastic in its praise. We hope to hear, ere long, that the device has been introduced in the Fire Department of this city, where many valuable lives and much property might be annually saved by its use.

Nevada Smelting Companies.

THE explanations of Mr. CRESSWELL, detailed in the verbatim report of the Pinto meeting, published in the last number of the *Mining World*, will do much to elucidate the position of matters in Nevada and the contiguous States. The real difficulty to grapple with is the cost of reduction. The present mode is either to sell on the spot at a ruinous sacrifice, or send the ores in the gross and rough down to San Francisco. According to the existing custom, they are sold there for 65 per cent. of the assay value. There are, besides, different charges for commissions on advances, and other brokerages, which raise the total cost, in the case of comparatively low grade ores, to something like 50 per cent. of the value. Such an expenditure and waste of capital can only be excused in a very primitive condition of affairs. We imagine that the influx of English capital must ere long effect a radical change in this direction. Indeed, it appears to us that there is a much more permanent and enduring source of income afforded by the erection of suitable smelting works than in the development of further mining properties—for a time, at least. But when capital is judiciously employed in the kindred business of mining and smelting, a larger measure of profit and security is apparent; for if the mines fail for a time, the smelting works can always be profitably employed in the reduction of ores from neighboring mines.

It is in this direction that English capital can be most profitably employed in Nevada. The operations of such a company cease to be purely of a speculative character, the business engaged being of a legitimate nature, and such as the requirements of the district call for. It should be remembered that the principal Anglo-American silver mining companies work chiefly on chlorides and bromides. The Utah, it is true, bases its prospects of success on argentiferous galenas, but these ores—in fact, all ores rich in lead, silver and copper—can only be successfully treated in suitable smelting furnaces. The satisfactory results likely to be achieved by the Utah, which prudently associates the businesses of miners and smelters are shadowed forth in the reports which have reached this country. We have a high opinion of Mr. Ross BROWNE, and this gentleman, in his memorable letter to the *Times*, distinctly stated, that by judicious investment in smelting works and the development of properties of demonstrated value, the products of these mineral regions might be doubled within a few years, and that he knew of no investment likely to pay better.

The Hamilton Smelting Company has been established to purchase and extend existing smelting works and mining property near Hamilton, White Pine county, Nevada. The required capital is £60,000 in shares of £5 each. The works consist of smelting furnaces and necessary plant complete, occupying a site of 9¼ acres of freehold land. The mining property consists of the following claims in near proximity to the works, viz., "Massachusetts," 1000 feet by 200 feet; "Marion," 1000 feet by 200 feet; the "Ebenezer," 600 feet by 200 feet; and "Silver Star," 800 feet by 200 feet—being a total of 4400 feet by 200 feet.

We are assured that near to the works there is an abundant supply of fuel at a moderate cost. Water is on the premises. The average daily working of the furnaces equals 30 tons of ore, calculated to produce 7 tons of bullion, of an average assay value of £40 per ton of silver, £16 per ton for lead, besides 15 to 30 per cent. of copper, which is not valued. The cost of the ore delivered at the works will average £4 8s. per ton, and the entire cost of smelting, it is said, will not exceed £2 4s. per ton. The estimated produce of 7 tons of bullion daily, reckoned for 300 working days, equals 2100 tons per annum, or a total produce of £117,000. Thirty tons ore daily, reckoned for the same period, equals 9000 tons ore, at a total cost of £77,000, leaving an annual profit of £40,000: Of course, an extension of the works would largely increase the profits.

Gold and Geology.

THAT theory may sometimes prove only a blind guide, and that a joker may sometimes have the laugh turned against himself, is the double "moral" of the following good story, told by a writer in *Lippincott's Magazine:*

"In the earliest days of gold-mining we established certain auriferous geological laws. It was legitimate that gold should be found only in certain locations on the river bank, in the bed, in gulches or flats, on riffles and bars. But gold was no respecter of these laws. There is near Columbia, Tuolumne county, a very large flat, over a mile in diameter, and perhaps four in circumference. It has been immensely rich. It is surrounded on all sides by hills. One day, some nineteen or twenty years ago, a negro walked over the flat. He had just arrived in the country; he had come to dig for gold. He approached a party of miners at work, and asked them where he had better dig. These were geological miners. They held that gold should be found only in flats and low places. They were also white miners. White miners, some nineteen years ago, felt themselves at full liberty to expend their rough humor over a solitary inquiring negro: so they told him that good diggings might be found up on yonder hill, pointing to one of the highest in the neighborhood, as yet untouched by pick or shovel. It was a good joke thus to send Ethiopia up the barren hill that hot summer's day, the mercury standing at one hundred in the shade. Ethiopia confidingly went, dug, perspired, and opened one of the richest claims in Tuolumne.

"Caucasia heard of it. The grin faded from her features. She dropped her picks and shovels, ran from the plain, ran up that hill, and in twenty-four hours it was entirely staked out in claims. Ethiopia had some trouble in preserving the integrity of his own legitimate mining boundaries. Caucasia ever after that was careful how she joked with inquiring negroes as to the locality of 'diggins.' She also lost confidence in her geology."

Fluorescence.

PROF. FLUCKIGER, of Berne, has discovered a liquid that shows the phenomena of fluorescence in a very remarkable manner. If about 70 drops of the essential oil of peppermint be shaken with one drop of nitric acid, sp. gr. 1.2, the fluid turns faintly yellow, it then becomes brownish, and after an hour or two exhibits a most beautiful blue violet, or greenish blue color when examined in transmitted light. When observed in reflected light, the liquid is of a copper color, and not transparent.

The Solidification of Carbolic Bisulphide.

A GERMAN chemical journal describes a very simple method of solidifying bisulphide of carbon, which usually requires a temperature of 90° C. This is effected by sending a rapid current of very dry air over the surface of the pure liquid contained in a glass vessel. If to water contained in a capsule a little bisulphide of carbon is added, it may be rapidly converted into ice by driving a current of dry air over it

THE COAL TRADE.

B. B. WESTERN, COAL EDITOR.

Anthracite Coals.

NEW YORK, August 27, 1871.

WHOLESALE.—Nothing of more than general interest or outside the usual routine of business in the coal trade has occurred during the past week. It has been several years since the trade has run along so smoothly without interruptions of any kind. Dealers generally express themselves well satisfied and report an enormous business as having been done since May 1st. The gradual advance in prices up to and including this month, has had a tendency to give strength and back-bone to the market, and confidence has generally been preserved. Even the large quantities of coal sold at the auction sales have not broken the market, and all has gone along "merry as a marriage bell."

The 93d auction sale of Scranton coal is announced in our advertising columns this week. 140,000 tons of the various sizes are offered in consideration of the facts that the market is in good condition, and in all probability there will be some competition between the steamship companies and large manufacturers, and also that it is getting late in the season for buyers that live at a distance. We apprehend that the reports will show an average advance of about 15 cents per ton. The fact of the Pittston prices for next month having also been promulgated, showing an advance of from 10 to 20 cents, will also give more confidence to buyers.

PRICES OF PITTSTON COAL FOR SEPTEMBER TO CONTRACTORS ONLY.

Lump	$4 90
Steamer	4 90
Grate	5 10
Egg	5 20
Stove	5 50
Chestnut	4 80

being an advance of 10 cents per ton in all sizes except Chestnut, which is 20 cents advance. All the other new prices will be given next week.

RETAIL.—There is a good business doing, and it is continually increasing as the season wears on and families return from the country. "Company coals" are selling at from $5 50 to $6 50 for different sizes. Lehigh, $7 50 to $8 50, delivered.

FREIGHTS.—Vessels have been very plentiful, and freights have receded a fraction during the past few days. Vessels have been taken up for Boston as low as $1 75, though generally $1 85 is the ruling rate. New Haven is quoted at $1; Bridgeport, $1.

GAS COALS.—There has been a marked improvement in American gas coals, during the past year, and they are fast superseding the foreign and Provincial gas coals. We understand that there have been only 100,000 tons of Provincial coal imported this year, while New York and vicinity alone have consumed over 100,000 tons of Maryland coal, being principally that mined by the Newburgh Orrel Coal Company and the Despard Coal Company. Herein we see the beauties of a protective tariff. Our many local coal-fields are now in a prosperous and flourishing condition. The contrary would have been the case had the free-traders had their own way in Congress, and allowed foreign coals to come in duty free.

BITUMINOUS COAL.—The Consolidation Coal Company report an active business doing for manufacturing and steamship uses. Prices remain unchanged.

Anthracite Coal Trade for 1870 and 1871.

The following table exhibits the quantity of Anthracite Coal passing over the following routes of transportation for the week ending August 19, 1871, compared with week ending Aug. 20, 1870.

COMPANIES.	1870. WEEK.	1870. TOTAL.	1871. WEEK.	1871. TOTAL.
*Phila & Reading R.R.	102,312	1,524 810	93 130	2,184,384
Schuylkill Canal	21,369	146,164	3 .686	567,225
Lehigh Valley R. R.	49,820	1,204.214	64,604	1,178,883
Lehigh & Sus. R. R.	20,830	598.590	26,862	685,590
Lehigh Canal	21,833	370,626	28,846	302,859
Scranton North	20,498	465 529	20,722	228 753
" South	33.710	1,122 495	60,354	656,833
Penn. Coal Co., rail	21,708	716,015	20,215	333 684
" " " canal	599	11,832	239	6,866
Del. & Hud. Canal Co.	50.406	983,774	35,951	466,648
" " East	6,970	241 799	10 369	169,144
" " West	1.831	51.148	3,564	51,582
South	7,538	290 399	8.692	155,485
Shamokin	14,439	2 3.441	15,482	402,825
Trevorton	2,318	50 150	....	....
Lykens Valley Coal Co.	5,725	34,449	....	54,573
Wyoming South	19,477	167,682	....	....
Wyoming North	....	....	....	4,167
P. N. Y. C. & R. R. Co.	5,676	190,391	....	104,987
Williamstown Co'y	6,920	185,201	....	....
Big Lick Co	....	42,124	....	83,259
Total	412,958	9.450 743	419,716	7,537,727
1870		7,537,727	412 958	
Decrease		1,913,016		
Increase				6,758

* Less coal transported for Co's use and Bituminous coal.

Bituminous Coal Trade, 1870 and 1871.

The following table exhibits the quantity of Bituminous Coal passing over the following routes of Transportation for the week ending August 19, 1871, compared with week ending Aug. 20, 1870.

COMPANIES.	1870. Week.	1870. Year.	1871. Week.	1871. Year.
B. & O. Canal	11,514	321.042	12,851	411,019
C. & O. R. R.	16,750	523,291	24,322	778,397
H. & B. T. R. R.	4 651	195 671	2,812	216,787
Harrisburg & D.	13,166	494,940	12,317	510,207
*L. V. R. R.		9,380	8,988	254,801
P. & N.Y.C. & R. Co.	5,551	157,136		
Cumberl'd Branch Canal	2,053	59.120	4,113	119,099
" Railroad	2,728	64,472	1,178	46,951
Total	56,413	1,825,052	66,581	2,337,261
			56,413	1,825 ,052
Increase.			10,168	512,209

The tonnage of the P. & N. Y. C. & R. R. Co. is included in hat of the L. V. R.R. Co.

Report of Coal Transported over Central R.R. of N. J. (Lehigh and Sus. Div.)

Week ending August 19—Compared with same time last year.

WHERE SHIPPED FROM	WEEK 1871., tons ct	WEEK 1870. tons ct.	YEAR 1871 tons cwt.	YEAR 1870. tons cwt.
Wyoming Region	27143 19	26079 18	716242 01	751181 11
Upper Lehigh Region	4167 01	3453 12	35463 19	90210 00
Beaver Meadow Region				
Hazleton Region	8185 10	8806 12	65229 05	177032 17
Mahanoy Region				
Tresckow Region	2844 13		24154 12	
Mauch Chunk Region	5367 00	2495 01	109265 10	35126 17
Totals	47708 03	41835 03	950355 07	1053551 05
Increase	5873 00			
Decrease			103195 18	
DISTRIBUTION.				
Forwarded East of Mch Chunk by Rail	26861 15	20889 19	685590 08	598076 14
Forwarded East of Mch Chunk by Canal	15276 00	15591 13	164046 06	283486 03
Delivered at and above Mauch Chunk	1520 13	1053 09	35870 06	26492 09
Delivered to L. & B. R. R.at PlymouthBridge	3509 16	3937 08	42974 08	129937 03
L. V. R. R at Packer'n	539 19	362 14	21873 19	15558 16
Totals	47708 03	41835 03	950355 07	1053551 05
Of the above there was transported on acc'nt of L. C. & N. Co.	8333 06	4124 08	150932 17	52410 01
W.-B. C. & I. Co.	15689 12	14048 19	516558 18	340500 05
Totals	24022 18	18173 07	667491 15	392910 06
Increase	5849 11		274581 09	
Decrease				

Report of Coal Transported over Lehigh Valley Railroad

Report of coal tonnage for week ending August 19, 1871, previously this season, compared with same time last year:

WHERE SHIPPED FROM.	WEEK. Tons. Cwt.	TOTAL Tons. Cwt
Total Wyoming	13,946 08	319,292 18
" Hazleton	49,568 00	600,810 15
" Upper Lehigh	72 08	1,095 13
" Beaver Meadow	17.337 07	213,223 18
" Mahanoy	7,014 17	334 334 18
" Mauch Chunk	17 14	6,641 10
" Sullivan & Erie		173 05
Total Anthracite	87.956 14	1,475,572 17
Bituminous Coal from all sources	8.988 00	254,801 00
Total by rail and canal	96,944 14	1,730,373 17
Same time last year	69,498 16	2,501,263 15
Increase	27,445 18	
Decrease		770,889 18
Forwarded East from Mauch Chunk by rail	69,604 05	1,178,882 16
Same time last year	49,829 13	1,994,213 19
Increase	14,774 12	
Decrease		815,331 03

RECAPITULATION.

Forwarded East from Mauch Chunk by rail	64,604 05	1,178,882 16
To N. C. R. R., at Mount Carmel		3,584 02
Forwarded North from L. & B. Junction	11,056 10	151,295 19
To L. & S. R. R. at Packerton for rail		3,818 17
Delivered at M'h Chunk	125 06	
Delivered on line of road above Mauch Chunk	42 10	688 04
Delivered above Mauch Chunk for use of L. V. R.R.	176 05	6,368 15
To L. & S. R. R., at Penn Hav., for railroad	930 08	32,460 08
Do. for canal		94 10
At M.Chunk for canal	7,917 08	69 226 04
	3,104 02	29,053 02
Total Anthracite	87,956 14	1,475,572 17
Bituminous Coal	8,988 00	254,801 00
Total all kinds	96,944 14	1,730,373 17

This report includes all Bituminous Coal carried over the Lehigh Valley and P. & N Y. Railroads from December 1st, 1870, to date.

Philadelphia and Reading R. R.

Amount of coal transported on the Philadelphia and Reading Railroad during the week ending Saturday, August 19, 1871:

	tons. cwt
From St. Clair	30,090 01
" Port Carbon	7,897 19
" Pottsville	965 15
" Schuylkill Haven	28,271 09
" Auburn	8,713 04
" Port Clinton	16,912 11
" Allentown and Alburtis	179 10
" Harrisburgh and Dauphin	12.317 13
Total paying freight	105,448 02
Coal for Company's use	3,076 03
Total for week	108.524 85
Previously this year	2,615,122 19
Total	2,723.647 04
To same time last year	2,062,793 03

Lehigh Canal Coal Trade.

Shipped for the week ending August 18, 1871.

	WEEK. Tons. Cwt.	TOTAL. Tons. Cwt.
Total from Mauch Chunk Region	9748 05	127978 02
" " Beaver Meadow "	3104 02	22608 05
" " Tresckow "	885 03	9397 17
" " Mahanoy "		3065 10
" " Hazleton "	8016 08	64540 07
" " Upper Lehigh "	1058 06	6555 09
" " Wyoming "	6063 09	68673 11
Total	28845 13	302859 01
Corresponding week last year	21833 00	370626 01
Increase	7012 12	
Decrease		67767 00

Pennsylvania Coal Company.

Shipments of Pittston Coal for the week ending August 19, 1871.

	1871. WEEK.	1871. YEAR.	1870. WEEK.	1870. YEAR.
By Railway	20,714 12	333.684 06	21,706 03	716.015 09
" Canal	239 08	6,866 02	598 16	11.832 08
Total	20 454 00	340,540 08	22,306 19	727,847 17

Decrease 1871, 387,297 09 tons.

Schuylkill Canal.

Report of coal transported over the Schuylkill Canal for the week ending Saturday, August 19, 1871.

	Tons. Cwt.
From Port Carbon	
" Pottsville	
" Schuylkill Haven	28,063 00
" Port Clinton	2,623 00
Total for week	30.686 00
Previously this year	536,538 18
Total	567,224 18
To same time last year	146,164 01

Shamokin Coal Trade.

For week ending August 19, 1871	15.481 18
Same time last year	14,439 07
Increase	
Decrease	1,042 11
Total amount shipped to date	402.824 18
Same time last year	263,440 11
Increase	139,384 07
Decrease	

Delaware, Lackawanna & Western Rail Roa Company.

Coal transported on the Delaware, Lackawanna and Western R. R. for week ending August 19, 1871.

	Week. Tons. Cwt.	Year. Tons. Cwt.
Shipped North	20,722 03	228 732 14
Shipped South	39,632 02	536,832 16
Total	60,354 05	765,565 10
For the corresponding time last year:		
Shipped North	20.408 08	465,528 12
Shipped South	33,710 16	1.122,405 04
Total	54.119 04	1,587,933 16
Increase	6,235 01	
Decrease		822,368 06

Delaware and Hudson Canal Company.

Coal mined and forwarded by the Delaware and Hudson Canal Campany for the week ending Saturday, August 19, 1871.

	WEEK.	SEASON.
North	53,604 19	663 096 02
South	8,691 10	155,485 02
Total	62,296 09	818,581 04
Corresponding time in 1870:		
North	42.049 18	1,433,811 00
South	7,357 19	290,399 17
Total	49 407 17	1,724,210 17
Increase North	12,888 12	
Decrease South		
Total decrease		905,629 13

Delaware and Hudson Canal Company.

The following is a statement of Coal transported by the Delaware and Hudson Canal Co., for the week ending August 19, 1871.

	WEEK.	SEASON.
By Delaware and Hud. Canal	35 951 00	466.648 00
By Railroad East	10.369 00	169,144 00
" West	3.564 00	51,482 00
" South	8,692 00	155,485 00
TOTAL TONS.	58,576 00	842,859 00
For the same period last year.		
By Delaware and Hudson Canal	53,406 00	983,774 00
By Railroad East	6970 00	241.799 00
" West	1831 00	51,148 00
" South	7538 00	290,399 00
TOTAL TONS.	68.565 00	1.567,120 00
Decrease	724,261 00	

Statement of Coal Transported over Cumberland and Pennsylvania Railroad

During the week ending Saturday Aug. 12, and during the year 1871, compared with the corresponding period of 1870.

WEEK.

	To C & O. Canal Tons. Cwt.	To B.&O. R.R. C. Tons. Cwt	Total. Tons Cwt.
1871	12,950 12	24 322 05	37,272 17
1870	11,513 13	16,750 07	28,264 00
Increase	1,336 19	7,571 18	8,908 17
Decrease			

YEAR.

1871	411,018 11	778,396 17	1,189,415 08
1870	321,042 09	523,291 03	844,333 12
Increase	89,976 02	255,105 14	345,081 16
Decrease			

Cumberland Branch

WEEK,

	To C. & O. Canal. Tons.	Cwt.	To B.&O.R.R. Co Tons	Cwt.	Total. Tons.	Cwt.
1871	4,112	11	1,178	09	5,291	00
1870	2,052	12	2,727	13	4,780	05
Increase	1,059	19			510	15
Decrease			549	04		

YEAR.

1871	119,098 12	46,950 12	166,049 04
1870	59,120 07	64,472 07	123,592 14
Increase	59,978 05		42,456 10
Decrease		17,521 15	

Huntington and Broad Top R. R. Co.

For week ending Aug 19, 1871	2,812 tons.
Same time last year	4,651 "
Increase	....
Decrease	1,839 "
Total amount shipped to date	216,787 "
Same time last year	195,671 "
Increase	21,116 "
Decrease	

Prices of Coal by the Cargo.

[CORRECTED WEEKLY.]

	AT NEW YORK. Aug. 11. R. A.	W. A.	AT PHILADELPHIA. Aug 24. R. A.	W. A.
SCHUYLKILL.				
Lump	$- —	$- —	— —	— —
Steamer	6 00	— —	— —	4 50
Broken	6 00	— —	— —	— —
Egg	6 25 —	— —	5 00	— — 4 75
Stove	6 50 —	— —	5 00	— — 5 00
Chestnut	6 75 —	— —	— —	— —
Pea	— —	— —	— —	— —
LEHIGH.				
Lump, (along side)	6 75	——	— —	— —
Broken	6 15	— —	— —	— —
Egg	6 00	— —	— —	— —
Stove	6 50	— —	— —	— —
Chestnut	5 50	— —	— —	— —
Pea	— —	— —	— —	— —
SPECIAL COALS.*				
Diamond Vein	R. A. 5 50@7 00		— —	— —
New England	" —		— —	— —
Locust Mountain	W. A.	6 50	— —	— —
Honey Brook, Leh'h	W.A. 5 00@6 25		— —	— —
Spring Mountain	" " 5 00@6 25		— —	— —
Sugar Creek	" " 5 00@6 25		— —	— —
Sugar Loaf	" " 5 00@6 25		— —	— —
Old Comp'y's	" " 5 00@6 25		— —	— —
Cross Creek	" " 5 00@6 25		— —	— —
Room Run	" 5 00@6 25		— —	— —
Girardville	" " —		— —	— —
McMichael	" " —		— —	— —
Shamokin	" " 5 25		— —	— —
Lykens Valley	" " 5 75		— —	— —
Broad Top	" " 5 25		— —	— —
Hill & Harris	" " — —		— —	— —
Henry Clay	" " — —		— —	— —
Powelton	" 5 25		— —	— —

*Dealers in these coals may be found in our advertising columns.

Line Prices for Coal August, 1871,

	Lump	Broken	Egg	Stove	Ches't
At Mauch Chunk	4.50	4.00	4.00	4.25	3.50
" Wilkesbarre	3 75	3.75	3.75	4.00	3.25

Company Coals.

August, 1871.

	L.	Str.	Gra.	Eg.	Sto.	Ches.
Scranton E. Port	4 80	4 [illegible]	5 10	5 50	5 75	4 75
*Pittston at Newburgh	4 80	4 50	5 00	5 70	5 40	4 60
*Lackawana at Rond't	4 70	4 90	5 15	5 40	5 75	4 85
Wilk'b're at Hoboken	4 65	4 65	5 00	5 25	5 75	4 75
Old Co. Lehigh at Pt John'n	6 25	— —	5 65	5 50	6 00	5 00
Lehigh at Eliz. Port	6 25	— —	5 65	5 50	6 00	5 00

For freights to different points see "Freights."
* To contractors.

Prices at Baltimore—August, 1871.

Wholesale Prices to Trade.

Wilkesbarre, by cargo or car load	$5 25@5 50
Pittston and Plymouth, do	5 2o@5 40
Shamokin Red or White Ash, do	5 2i@5 40
Lykens Valley Red Ash, do	— —@5 80
Zerba Valley	— —@— —
Treverton	— —@— —
By retail, all kinds per ton of 2240 lbs.	7 00@7 50
Georges Creek & Cumberland f. o. b. at Locust Point for cargoes	— —@4 75
Fairmount and Clarksburg gas, f. c. b. at L. Point	6 00@6 50
BITUMINOUS COALS.	
Kittaning Coal Co.'s Phœnix Vein f.o.b. at Phila	$ —
Lemon " " "	—
Cumberland Vein Coal	—
Consolidation Coal Co.'s on board N. Y.	6 75
Maryland Coal Co. " "	6 75

Prices at Georget'n, D.C., & Alexandria, Va.

August, 1871.

George's Creek and Cumberland f. o. b. for shipping...$4 50@4 60.

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$5 50@5 75
Lykens Valley	6 00@6 20
Shamokin Red or White Ash	5 50@6 50
Treverton and Zerba Valley	— —@— —

Prices at Mauch Chunk.

AT PHILADELPHIA.	
Powelton	$6 75
TO NEW YORK.	
Provincial.	
Sidney	$3 [illegible]
Lingan	3 25
Cow Bay	3 37½
Port Caledonia	3 37½
Little Glace Bay	3 25

Prices at Havre de Grace, Md.

Wilkesbarre and other White Ash for cargoes	$5 50@5 75
Lykens Valley	6 00@6 20
Shamokin Red or White Ash	5 50@6 50
Treverton and Zerba Valley	— —@— —

Prices of Gas Coals.

August, 1871.

PROVINCIAL.

Corrected weekly by Louis J. Belloni, Jr., 41-43 Pine st., N. Y

Duty, $1 25, gold

	Coarse	Slack.
Block House	$1 75	@-1 75
Gowrie	1 75	@-1 75

Corrected by Bird, Perkins & Job, 86 South street.

	Coarse.	Culm of Coal.
Picton	$2 25	@1 25
Sydney	2 25	@- 80
Lingan	1 60	@- 80
Little Glace Bay	1 60	@1 00
Caledonia	1 60	@- 80

A discount from the prices of the coarse Coal on purchase of 5000 tons and upwards. Duty $1 25 per ton, gold, on the coarse coal. 25 per cent. ad valorem on the Culm of Coal.

AMERICAN.

	Currency.
Westmoreland	$7 00 @- —
Fairmount Gas Coal Co. of N. Y.	7 00 @- —
Despard Coal Co	7 00 @- —
Penn	7 00 @- —
Newburg Orrel Gas	- —@- —
West Fairmount Gas Coal	7 00 @- —

Freights.—August, 1871

Cumberland. To Eastern Ports.	From Georgetown.	From Baltimore.	Anthracite. From Philada.	From East Port, Port Johnson, and Hoboken.	From Newburg.	From Rondout.
Amesbury			$2 50	$1 75		
Bangor	$2 75		2 30	1 75		
Bath	2 75	2 65	2 30	1 75		
Boston	2 60	2 60	2 25	2 00	120	1 80
Bridgeport	2 25	2 30	1 80	1 60	1 10	1 25
Bristol		2 60	2 00	1 40		1 55
Cambridgeport			2 75	2 00		
Derby			2 00	1 20		
Dighton	2 30	2 35	2 30	— —		
East Cambridge			2 35	2 00		
Fall River	2 25	2 30	2 25	1 40	1 40	
Hackensack			1 75	90		
Hartford	2 75	3 00	2 30	1 50		
Jersey City		2 00	1 40	50	70	
Middletown			2 25	1 25		
Mystic			— —	1 10		
New Bedford	2 50	2 35	2 00	1 40		
Newburyport	2 75		2 40	1 60		1 35
New Haven	2 25	2 30	1 90	1 00	1 10	2 20
New London	2 25	2 30	1 70	1 15		1 25
Newport			2 00	1 40		1 40
New York	2 00	1 90	1 35	55	70	65
Norwalk		2 30	1 80	1 00	1 10	
Norwich	2 25	2 30	2 00	1 20	1 40	1 50
Pawtucket	2 50	2 50	2 30	1 40		1 65
Portland	2 50	2 60	2 30	1 85		2 00
Portsmouth, N.H	2 75	2 75	1 45	1 80		1 50
Providence	2 25	2 50	2 00	1 40	1 50	
Rockport			2 10			
Saco	2 75		2 25	1 75		
Sag Harbor			1 70	1 20		
Salem	2 60	2 65	2 35	1 80		
Stamford			2 00	1 00	1 10	
Stonington			2 00	1 25	1 20	1 40
Taunton			2 30	1 50		
Warren			— —	1 30		
Washington			1 25			
TO RIVER PORTS.						
Albany		80			55	
Catskill		70			50	
Cocksack'e		70			50	
Cooyman's		70			65	
Cold Spring	2 20	70			30	
Fishkill		70	1 60		30	
Haverstraw					60	
Hudson	2 20	2 25			40	
New York					60	
Nyack			1 75		30	
Poughkeepsie					30	
Rhinebeck						
Rondout					75	
Saugerties			1 60		40	
Sing Sing					75	
Stuyvesant					75	
Tarrytown					76	
Troy					55	
West Point			1 75			
Yonkers					60	

Prices of Foreign Coals.

August, 1871.

Duty $1 25 per ton.

Corrected weekly by PARMELE BROS., No 32 Pine street, N. Y.

Liverpool Gas Caking	$ 8 00@— —
" " Cannel	11 50@12 00
" House "	— —@16 00
" Orrel	12 00@14 00

Per ton 2,240 lbs., ex-ship.

PRICES FROM YARD.

Liverpool House Orrel, screened	$16 00@17 50
" Cannel, "	18 00@20 00

Per ton 2,240 lbs. delivered.

Foreign and Provincial Freights.

August, 1871.

Foreign.	
Newcastle and Ports on Tyne, per keel of 21 1-3 tons	£14 00@£16 00
Liverpool, 5 per cent primage	13s @15s.

Rates of Transportation to Tide Water.

BY RAILROAD.

TO PORT RICHMOND, PHILADELPHIA.

Philadelphia and Reading Railroad, from Schuylkill Haven for consumption	$1 95
For reshipment	1 85

MAUCH CHUNK TO ELIZABETHPORT.

L. V. Railroad from Mauch Chunk to Phillipsburgh	$0 85
C. R. R., N. J., Phillipsburgh to Elizabethport	1 26
Shipping expenses at Elizabethport	25
Wharfage	10
Total	$2 46

MAUCH CHUNK TO PORT JOHNSON.

L. V. R.R., or L. & S. R. R. from M. C. to Phillipsb'g	$0 85
C. R. R., of N. J., Phillipsburgh to Pt. Johnson	1 26
Shipping expenses	25
Wharfage	10
Total	$2 46

TO HOBOKEN.

L. V. R. R., Mauch Chunk to Phillipsburgh	$ 85
Morris & Essex R. R. Phillipsburgh to Hoboken	1 25
Shipping expenses	20
Warfage	16
Total	$2 46

TO SOUTH AMBOY.

L. V. R. R.	85
B. & D. R. R.	
Cam. & Am. R. R.	1 21
Shipping Expenses,	5
Total	$2 41

PENN HAVEN TO ELIZABETHPORT.

L. V. R R. Penn Haven to Phillipsburgh	90
C. RR. of N. J. Phillipsburgh to Elizabethport	126
Shipping expenses	25
Wharfage	10
Total	$ 2 51

BY CANAL.

Via Schuylkill Canal.

TO PHILADELPHIA.

From Schuylkill Haven	Toll $1.25	Freight, 90c	$2 15
" Port Carbon			....
" Port Clinton	" 1.18	" 85c	2 02

Drawback 15 cents during August.

TO NEW YORK.

From Schuylkill Haven ....Toll..1 10 Freight..$1 85..$2 95

The Rates of Toll on Lump and Steamer Coal will be ten per cent less than the above rates. The charge will be per ton of 2240 lbs. No charge less than Forty Cents per ton will be made for any distance. A drawback of thirty cents is allowed on all coal passing Fairmount Locks used at Philadelphia and vicinity.

Via Lehigh Canal.

TO PHILADELPHIA

Lehigh Canal	$ 76
Freight and towage	1 10
Total	$1 86

TO NEW YORK.

Lehigh Canal	$1 48
Morris Canal	..
Freight	..
Towing	208
Total	$2 56

TO JERSEY CITY.

Lehigh Canal	$ 48
Morris Canal	2 06
Freight	
For re-shipment	2 54

Via Delaware and Raritan Canal.

TO NEW YORK.

Lehigh Canal	$ 76
Delaware Division Canal	38
Delaware and Raritan Canal	
Freight	1 25
Towage	20
Total	$2 59

TO NEW BRUNSWICK.

Lehigh Canal	$ 76
Delaware Division Canal	
Delaware and Raritan Canal	38
Freight	1 25
Total	$2 39

MARKET REVIEW.

FOR THE WEEK ENDING AUG. 25, 1871.

IRON.—The market for Scotch Pig has been rather quiet, but, as the stock is very much reduced, prices still have a hardening tendency; sales have been made of 250 tons Gartsherrie at $34 50 from ship, and $35 50 from yard; and 500 do. Eglinton on private terms—the market closing at $33 for Eglinton, $34@$34 50 for Glengarnock, $35 for Gartsherrie, and $36 50@$37 for Coltness. In American, we have nothing new to note; the limited supply restricts business, and prices are very firm; 600 tons No. 1 Lehigh sold at $36. New Rails are in light stock, and with a good inquiry, prices are a trifle firmer —500 tons Double-headed sold at $39 25@$39 50, gold. We quote English $57@$58, gold, and American $69@$71, currency, at the works in Pennsylvania. Refined Bar is very firm, and 10s. higher in England, making the recent advance there 15s. in all. The Philadelphia makers are all behind with their orders, and some of the Western mills are closed for repairs, etc. Russia Sheet has been quiet, but is firmly held at $12½@13c., gold. We omitted to mention in our last, a sale of 1,000 bundles R. G. English Sheet, on private terms.

The following is condensed from S. W. HOPKINS & Co.'s London Circular, of 9th inst.:

EXPORT OF RAILS FROM GREAT BRITAIN.

	Month ending July 31. 1869.	1870.	1871.	7 mons. ending July 31. 1869.	1870.	1871.
U. States, tons	35,249	41,495	42,385	203,597	238,540	287,169
Br. America	1,643	6,763	9,859	19,258	22,412	37,138
Brazil	311	282	656	872	2,600	12,271
Chili	85	689	1,723	2,626	10,084	7 223
Peru	3,315	176	1,973	14,624	8,973	14,667
Russia	35,731	26,094	7,610	122,517	140 548	54 5 9
Germany	3,907	9,805	4,772	10.237	41,020	36 9?2
British India	8,533	11,000	889	46,032	113,564	27,655
Oth. Countries	14,859	10,588	18.404	99,959	91,255	86,518
Total	103,938	106,892	88,281	519,722	669,601	564,472
Old Iron to all countries	8,933	10,528	13,907	57,399	67,927	72,518
Pig Iron to United States	10,897	8,760	11,704	75,909	62,864	104,373

LEAD.—Pig remains very quiet, and we have only to notice the sale of 50 tons Spanish at $6 10, gold. Bar 9¼c.; Sheet and Pipe, 10½c., and Tin-lined Pipe, 15c.—all less 10 ₱ cent. to the Trade.

COPPER.—New Sheathing is steady at 30c., and Bronze and Yellow Metal Sheathing 22c., cash. Ingot is very quiet, but steady and firm at previous rates; the sales embrace 200,000 lb. Lake, in lots, at 22½c., on the spot, and 23½c. for forward delivery.

SPELTER.—The demand for Foreign is very limited, and prices are nominal at 5½@6½c., gold. Twenty tons Missouri Zinc Co., selected, sold at 9½c., currency.

STEEL.—There is a good stock and fair demand, and prices are steady.

TIN.—There is a moderate business in Pig, at about the prices previously ruling, though there is still some unevenness in the market. Sales have made of 500 slabs Straits at 36@36¼c.; 100 do. Banca (which is scarce), 40¼c.; and 20 tons English, 34¼@35c., all gold. The telegrams from Singapore again quote a slight advance, the price there being now $34 50 ₱ picul. Plates are steady, with a moderate business; the transactions embrace 1,200 bxs. Charcoal Tin at $8 75 for I. C.; 200 do. I. C. Coke, 10 by 14, $8; 250 do., 14 by 20, $8 12½; and 900 do. Charcoal Terne, $8 12½@$8 25, all gold.

ZINC.—Sheet is steady and firm at 9@9½c., currency, for No. 9 from store, with small sales—agents' price of Mosselmann, 8¼ cents, less 4 ₱ cent., gold, for arrival. American Oxide, 6½@7c.; French, 9½@10½c.; Manganese, 4@4½c.

METALS.

NEW YORK, Aug. 23, 1871.

IRON.—Duty: Bars, 1 to 1¼ cents ₱ lb; Railroad, 70 cents ₱ 100 lbs.; Boiler and Plate, 1¼ cents ₱ lb; Sheet, Band, Hoop, and Scroll, 1¼ to 1¾ cents ₱ lb; Pig, $7 ₱ ton; Polished Sheet, 3 cts. ₱ lb; Galvanized 2¼; Scrap Cast, $6; Wrought, $8 per ton.

	Store Prices.
Pig, Scotch No. 1, ₱ ton	33 00@36 50
Pig, American, No. 1	36 00@37 00
Pig, American, No. 2	34 00@35 00
Pig, American, Forge	33 00@34 00
Bar Refined, English and American	75 00@76 00
Bar Swedes, assorted sizes (gold)	85 00@100 00
	Store Prices, Cash.
Bar, Swedes	105 00@120 00
Bar, Refined, ord'y sizes	80 00@ — —
Bar, Refined, ¼ @ 5-16 inch	— —@ 85 00
Bar, Rlfined, 1 & 1¼ by ¼ & 5-16	— —@ 87 50
Bar, Refined, 2½ to 3 Rouud & Square	— —@ 87 50
Bar, Common	— —@ 87 50
Scroll	100 00@130 00
Ovals and half-round	97 50@122 50
Band	— —@ 95 —
Horse Shoe	95 00@100 00
Rods, ⅝ to 3-16 inch	85 00@120—
Hoop	105 00@145 00
Nail rod	— —@6¾ —
Sheet, Russia, as to assortment (gold)	12¾@13
Sheet, Single, I). and T. Common	—4½@— 5¾
Sheet, D. and T. Charcoal	—5¾@—6¾
Sheet, Galv'd, Nos. 14 to 26 ..... 30 ct. dis.	12@14c ₱
" " Nos. 27, 28, and 29 ..... 30 ct. dis.	15@18c ₱
Rails, English (gold), ₱ ton	57 00 @— —
Rails, American, at Works in Pa	69 00 @71 00

STEEL.—Duty: Bars and ingots, valued at 7 cents ₱ lb or under, 2¼ cents; over 7 cents and not above 11, 3 cents ₱ lb; over 11 cents, 3¼ cents ₱ lb, and 10 ₱ cent ad val. (Store prices.)

English Cast (2d and 1st quality) ₱ lb	— 15	@— 18
English Spring (2d and 1st quality)	— 7	@— 10
English Blister (2d and 1st quality)	— 10	@— 17
English Machinery	— 11	@— 13
English German (2d and 1st quality)	— 10½	@— 12
American Blister "Black Diamond"	— —	@— 12
American, Cast, Tool do.	— 15	@— 16
American, Spring, do.	— 9	@— 11
American Machinery, do.	— 10	@— 11
American German, do.	— 9	@— 11

COPPER.—Duty: Pig, Bar, and Ingot, 5; old Copper 4 cents ₱ lb; Manufactured, 45 per cent. ad val.

	All Cash.
Copper, New Sheathing, ₱ lb	— @— 30
Copper Bolts	— @— 32
Copper Braziers, 16oz. and over	— @— 32
Copper Nails	36 @— 38
Copper, Old Sheathing, &c. mixed lots	— @— 19
Copper, old, for chemical purposes, 14@16 oz	20 @— 21
Copper, American Ingot	22¼@— 23
Yellow Metal, New Sheathing & Bronze	— @— 22
Yellow Metal Bolts	24 @— —
Yellow Metal Nails	— @— 22

LEAD.—Duty: Pig, $2 ₱ 100 lbs.; old Lead, 1½ cents ₱ lb: Pipe and Sheet, 2¾ cents ₱ lb.

Galena, ₱ 100 lbs	$— @— —
Spanish (gold)	6 05 @6 10
German, do.	6 05 @6 10
English, do.	6 15 @6 50
Bar (net)	9 25 @ —
Pipe (net)	— — @10 25
Sheet	— — @10 25

Colwell, Shaw & Willard Tin-Lined Lead Pipe 15 cts. ₱ lb.

SPELTER—Duty: In Pigs, Bars & Plates, $1.50 p. 100 lb

Plates, Foreign (god) l. p. 100 lb.	5 75 @ 6 12½
Plates, Domestic p. lb.	— 7 @— 11 ¼

TIN.—Duty: Pig, Bars, and Blocks, 15 ₱ cent. ad val.; Plate and Sheets and Terne Plates, 25 ₱ cent.; Roofing 25. ad val.

	Gold ₱ lb.
Banca	40¼@—
Straits	36¼@36½
English	34¾@35

PLATES. *Fair to Good Brands.*	*Gold.*	*Currency.*
I. C. Charcoal, ₱ box	$8 62½@9 00	$10 25 @10 75
I.C. Coke	7 50 @8 50	9 00 @10 00
Coke Terne	6 25 @7 50	7 25 @ 9 00
Charcoal Terne	8 00 @8 50	9 50 @ 10 00

ZINC—Duty: Pig or Block, $1 50 ₱ 100 lb.; Sheet, 2½ cts. ₱ lb.
Sheet, No. 9 Foreign ₱ lb. — @— — 9 9½

San Francisco Stock Market.

"By Telegraph."

Our report from the San Francisco Mining Stock Board is dated California, Aug. 21st. The market is weak and irregular. The only noteworthy changes, as compared with last week, is an advance in Yellow Jacket and Kentuck, and a falling off in Crown Point. On the 18th inst. sales of Hale & Norcross were effected at $93. The following is the report in full.

Savage	39½
Yellow Jacket	67½
Kentuck	132½
Cholar Potosi	32½
Gould & Curry	103½
Belcher	225
Imperial	41¼
Amacor	No Sales
Crown Point	274
Hale & Norcross	—

Mining Stocks.

NEW YORK, August 24, 1817.

The transactions of the Mining Stock Board for the past week, can all be recorded in the following few words: "300 shares of La Crosse were sold at the First Board, yesterday, 23d inst., for 18c., and 300 for 19c.," which price does not materially vary from our quotation of the same stock last week. Benton, Gregory, and Central are weaker. With these exceptions the list is unchanged, and we are afraid that only some sort of a change in the Board will prevent us from using such an inactive term so often. The quotations are as follows:

GOLD STOCKS.

	BID.	ASKED.
American Flag	10	20
Bates & Baxter	25	—
Benton	—	5
Black Hawk	35	—
Central Gold	4	—
Cons Gregory	30	40
Grass Valley	7	—
Gunnell	15	—
Holman	—	—
La Crosse	18	—
Liberty	—	—
Mariposa prf	—	—
Montana	—	—
Rocky Mount	—	5
Quartz Hill	—	30
Smith & Parmlee	22	40
N. Y. & Eldorado	15	—

Without exception, Petroleum is weaker. Central, Bergen Coal and Oil, and New York and Allegheny are notably so. No sales have transpired during the week. We quote from the report of the Board as follows:

PETROLEUM STOCKS.

	BID.	ASKED.
Bennehoff Run	20	—
Bergen Coal and Oil	15	—
Bliven Oil	30	—
Blood Farm	—	50
Breevoort	30	50
Buchanan Farm	40	—
Central	55	65
Clinton	—	—
Home	150	—
National	15	—
New York & Allegheny	75	—
Northern Light	30	—
Phillips Pet	—	15
Pithole Creek	—	100
Rathbone Oil	20	—
Rynd Farm	33	—
Second National	—	40
Sherman & B	—	—
Tarr Farm	—	—
United Petroleum Farms	28	—
United States	—	60
Hoffman	—	—

Weekly Slate Trade Report—Hydeville.

ROOFING SLATE.

Week ending Aug. 19, 1871.

NAME OF COMPANY.	WEEK.	PREVIOUSLY.	TOTAL FOR YEAR.
Eagle Slate Co	105	3350	3455
Western Vermont Slate Co.	....	314	314
Blue Slate Co	40	1728	1768
The Evergreen Slate Co	264	3456	3720
Forest Mining Slate Co	....	448	448
West Castleton Slate Co	....	....	....
E. D. Billings	....	949	949
R. M. Copeland	....	404	404

Coating Metal with Nickel.

BY the invention of Mr. E. D. NAGEL, Hamburg, iron, steel, and other oxidizable metals are coated with an electro deposit of nickel or cobalt, in the following manner: The inventor takes 400 parts by weight of pure sulphate of the protoxide of nickel by crystallization, with 200 parts by weight of pure ammonia, to form a double salt, which he then dissolves in 6,000 parts of distilled water, and adds thereto 1,200 parts of ammoniacal solution of the specific gravity of 0.909. The electro deposition is effected by an ordinary galvanic current by using a platinum positive pole, the solution being heated to about 1000° Fahr. The strength of the galvanic current is regulated according to the number of objects to be coated. For coating with cobalt, 138 parts by weight of pure sulphate of cobalt are combined with 69 parts of pure ammonia to form a double salt, which the inventor then dissolves in 1100 parts of distilled water, and adds thereto 120 parts of ammoniacal solution of the specific gravity of 0.909. The electro deposition is effected as with the nickel process.—*The Mechanic's Magazine.*

Wire Tramways.

A TELEGRAM has been received by the Wire Tramway Company, Limited, from the Sestarena Mines, North Italy, stating that the new steel rope had been put on the wire tramway, which was carrying an average of forty-five tons a day, a quantity considerably in excess of the requirements of the mine. During this week lines of wire tramway have also been put nto successful operation for the Ebbw Vale Iron Company, and for the Imperial Prussian Iron Works, at Eisleben, in Germany. The Sestarena line has been perhaps the most difficult Mr. Hodgson has attempted, and its success in this thoroughly Alpine country is a great step. Of lines in less difficult ground there are some thirty or forty in operation now.—*The Mechanic's Magazine.*

A New Smelting Establishment.

IN another column will be found an advertisement of a company whose works for the treatment of argentiferous lead are about completed. They are in need of skilled labor to carry on their work, and we have no doubt that the supply is equal to the demand.

Rock Salt in Prussia.

AT Spernberg, near Berlin, a deposit of rock salt was discovered, whose thickness, so far, has been found to exceed 2962 feet, and whose horizontal extension seems to be equally great. Near Segeberg, in Holstein, another deposit has been discovered, which promises to be of similar magnitude.

Musical Instruments.

THE pianoforte, which seems to have been derived from a combination of the clavichord and the spinet, was first invented in the early part of the eighteenth century. BARTOLOMMEO CHRISOFALLI (before 1711) appears to have been the original inventor, but CHRISTOPHER SCHRÖTER suggested the name (1717), by the observation that it could be played "either *forte* or *piano*." The same expression is found in the title of a patent granted to JOHN HARRIS in 1730, for "a new-invented harpsichord upon which (having only two sets of strings) may be performed either one or two unisons, or two unisons and one octave together, or the fortes and pianos, or loud and soft, and the contrary may be executed as quick as thought, and also double basses, by touching single keys." The first piano known to have been in England was brought from Germany in 1757, and ten years afterwards, in 1767, one was advertised at Covent Garden Theatre as a new instrument. The earliest patent granted in England, relating to this subject, was taken out by STODART, 1777, and the next by BROADWOOD, in 1783. After this, the number of patents became very numerous. The earliest entry of the sale of a piano on Messrs. BROADWOOD's books is 1771, of a grand piano, 1781. At that time the harpsichord (which was practically a harp played on by slips of wood called Jacks) was being rapidly driven out of fashion by the piano, and the newer instrument, at first not very popular, was the only one made. The first patent for an upright piano was granted to W. STODART, in 1795, and in 1807 SOUTHWELL made it less unwieldy, and gave it the name of "cabinet," which it has since kept. From 1831 to 1851 Messrs. COLLARD sold about 32,000 pianos, Messrs. BROADWOOD 45,863. In 1853 it is said that pianos were produced in England at the rate of 1500 a week.—*English Ex.*

Approaching Solar Eclipse.

NATURE understands that its anticipations last week with reference to the Australian observations of the total solar eclipse of December next are being realized. The Royal Society of New South Wales is organizing an expedition to Cape Sidmouth, a little south of Cape York. The President of the Royal Society of London has arranged that a few instruments of the newest construction shall be sent out.

SEVENTY vessels were captured by the Alabama, thirty-six by the Florida, nine by the Georgia, thirty-six by the Shenandoah, thirty-four by the tenders, thirteen by the Sumter, twenty-nine by the Tallahassee, and two by the Nashville. The claims on the captures of the four vessels first named amount to about 12,000,000 dollars.

DEPARTMENT OF POPULAR SCIENCE.

Darwin's Hypothesis of the Origin of Species.

IV.

WE have now considered the facts of multiplication, limited population, competition, variation, and transmission, and seen how these combine, according to the hypothesis of DARWIN, to cause the survival, permanence and predominance of the fittest types of form, structure and other advantageous peculiarities. But, it may be asked, what becomes, on this hypothesis, of a species which is at last perfectly fitted to the natural conditions of its residence? It is implied, that under such circumstances the characteristics of a species would not change, and its numbers would increase. But, in fact, such circumstances do not occur. No species is in that sense perfectly fitted to its conditions. No species is so protected as to be utterly safe from its enemies; and, above all, no species is secure against famine. For there is only a certain amount of suitable food furnished annually by a given area. If, therefore, we suppose that in the process of many generations, the surviving individuals of a species have become perfectly protected against their natural enemies, it will follow, first, that these natural enemies will decrease for want of food; secondly, that the protected species will tend to increase with great rapidity, but will be checked by want of food. This will weaken all the individuals; but those which, being the stronger, have the best chance of obtaining food, or those which can go or reach for food where others cannot, will survive. Thus some individuals of a browsing tribe might make long migrations into new pastures, while others, with long necks, might stay at home, and feed on the branches of trees.

It is evident, therefore, that different species compete with one another, even where one is not the food of the other. Moreover, under stress of long continued privations, species might gradually change their habits, and become carnivorous. And finally, the numbers of each species are a fluctuating equilibrium, depending upon the conditions of climate and food and the numbers of rival species. In other words, no species is perfectly fitted to increase indefinitely, and every living species is fitted to exist just as it does exist, with respect to numbers and conditions, or it would not exist at all.

7. *Alteration of Conditions.*—But this fitness of a species as a whole to its conditions requires a change if the conditions change. We have already seen that the conditions of food and enemies do change perpetually; the spread of civilization, the cultivation of the soil, and the destruction of wild animals by man, produce serious changes, which are often so rapid as to almost annihilate species. But the changes of natural conditions, though infinitely slower, are far more profound. Geology teaches us that whole continents have been submerged in the sea; that tropical climates have been enveloped in perpetual frost; and finally, that innumerable species have become extinct. These immense changes must have caused either sudden annihilation or wide modification of living forms. The opinion of the best geologists is, that the changes were not sudden and convulsionary, as was once believed, but in general very slow and gradual. Hence they would give time for the generations inhabiting land and sea to accommodate themselves to new conditions, by the process of natural selection, and thus originate what we now recognize as new species. The same applies to plants.

This is a brief and rude outline of the hypothesis of DARWIN. We may put it in a small compass thus:

M=Multiplication.
P=Population.
C=Competition.
V=Variation.
T=Transmission.
S=Natural Selection.
A=Alteration of Conditions.

O=Origin of Species.

M P=C.
C V T=S.
S A=O.
V A M P T=O.

Or, Variation under Altered Conditions, combining with Multiplication, and controlled by the limits of Population, produces Transmitted Peculiarities, which constitute the Origin of Species.

Or, as a scornful opponent might say, the Theory of Darwin is a

Vampt-up affair, amounting to O!

This being the hypothesis, the question is, is it sufficient to account for the facts. An absolute demonstration that all species did originate in this way is manifestly impossible. All that the friends of the hypothesis claim is that all species might thus have originated; and its opponents attempt to adduce facts which it cannot satisfactorily explain.

Let us first mention, by way of illustration, one or two striking facts which the hypothesis does plausibly explain.

There are, perhaps, 600 species of beetles inhabiting the island of Madeira, of which 200 are so far deficient in wings that they cannot fly. Out of 29 genera, 23 have this peculiarity. Moreover, certain large groups of beetles, which are elsewhere excessively numerous, and which have habits of life almost necessitating frequent flight, are absent from that island. Mr. DARWIN explains this as a case of natural selection, perhaps combined with disuse of the organ. For, as he says, flying beetles are frequently blown to sea and drowned, and hence, for many successive generations, those beetles which flew least, either from having imperfect wings or from indolence, would have the best chance of surviving. Those beetles which are ground-feeders could change in this respect without perishing for want of food.

But flower-feeding beetles, butterflies, and moths habitually use their wings to obtain subsistence. Hence, these species in Madeira have their wings enlarged, not stunted. In other words, natural selection, using the wind as an agent, has perpetuated those forms which fly least, and those which fly best. As Mr. DARWIN says, the case is like a shipwreck near the shore. Some, who are the best swimmers, get to land; others, who cannot swim at all, stick to the wreck and are saved; the rest are drowned.

R. W. R.

The Difficulties in the Identification of Coal Beds.

BY R. P. ROTHWELL.*

THE first difficulty mentioned is that in some instances two or more beds of coal separated by sandstone or slate rocks of considerable thickness in one part of a basin, are found running together in another part. Of course, we may happen to strike first the part of the basin where there is but a single seam, and in this case the bed would appear to divide into two or more branches within a short distance. Such cases are not rare in the anthracite coal fields.

I would suggest as an explanation of this phenomenon the gradual sinking of the peat-marsh—the embryo coal bed—on one side, and the moving forward of the marsh, so that on one part of the bed the formation of peat would still be progressing, while another part, being under water, would be covered with mud and sand. Thus we have different portions of the same bed of different ages. Now if the sinking of the marsh be stopped for a time, the bed will become thicker in the portions left exposed, and if the sinking now changes in direction, so that the part that had previously gone down commences to rise, we should have the phenomenon of a bed, continuous throughout, with one portion overlying another, and separated from it by rock strata. These are exactly the conditions observed in splitting beds. While one side of the lake is sinking, and the peat-marsh moving on in that direction, the other side may be rising, and another peat-bed be there forming over the first bed, and separated from it by a slate or sandstone rock; or we have two distinct beds, not in any way connected—never running one into the other—and yet they are being formed at the same time.

Since the *flora* of a country is constantly changing—witness, for example, Canada and this country, where in some places the entire native small plants have absolutely disappeared, having been driven out, like the red man, by European invaders—the *flora* of different parts of the same coal bed, formed at different times, will probably differ more than that of distinct beds formed at the same time.

The careful study of the intervening rocks, as well as of several beds, is frequently required to enable us to identify the same bed at different portions of the coal basin. The character of the coal itself is so exceedingly variable, within short distances in the same bed, that we can not place much reliance upon the similarity of the coal in different places, as showing that the beds are identical.

* Abstract of a paper read on August 17th, before the American Institute of Mining Engineers.

Correspondence from Humboldt County, Nevada.

TO THE EDITOR—Sir: Last June, the Arizona Association completed the tailings mill commenced in May. The mill has six WHEELER pans and three settlers, put in motion by a horizontal engine. An 18-inch in diameter turbine wheel, with a 45 feet head of water to work it with, has been placed to drive the mill, when the supply of water is sufficient in the cañon. Since the mill was erected water has been low, and the mill run by steam.

About 25 tons of tailings, brought from the Arizona mill reservoir by a one-horse cart, are worked daily. This second working extracts very imperfectly the silver. The Association has determined to build an Aikin furnace to roast the tailings, and extract the quicksilver contained in them, by sublimation and condensation of the fumes. It is reckoned that every ton of tailings holds from 2 to 3 lbs. of quicksilver.

The Arizona mine keeps the Arizona mill and the Silver Mining Company's mill continually at work. Besides, the usual percentage of shipping ore is picked out for San Francisco. A tramway from the dump of the mine, about 1900 feet long, to the bottom of the cañon below, will soon be completed. It is at about an angle of 30 to 40 degrees, and the full box will raise the empty one by an endless wire rope.

Last month the Pioneer and Inskip Company have begun work on the Henning, an old claim of theirs. The prospects for a good mine are favorable. They have 10 to 15 tons of milling rock on the dump now.

The work on the North Star is continued, and the usual supply of ore extracted for the Pioneer mill.

The boys on the Peru have very good prospects. They have 5 to 6 tons of very good ore out.

ENEAS SMITH, the President of the Batavia and Pacific Gold and Silver Mining Company, has taken up his residence in this town. The Company he represents is working the Batavia and Pacific lode in Relief District, about 30 miles south of this place. A mill has just been erected, about 3 miles below the mine, for reducing the ore. The water necessary for the mill (a steam mill) has been brought in a wooden flume from springs about 2 miles distant.

D. V. L.

The Reaction of Ozone.

A RUSSIAN chemist has devised a simple experiment for this purpose. Invert a Hofmann eudiometer, and, after connecting the platinum wires with an induction apparatus, pass oxygen gas slowly through the tube, and then through LIEBIG'S potash bulbs, in which is a solution of iodide of potassium and starch. The presence of the ozone will presently be shown by the liberation of the iodine and the bluing of the starch.

THE ENGINEERING AND MINING JOURNAL.

ROSSITER W. RAYMOND, Ph. D.,
WILLARD P. WARD, M. E.,
Editors.

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THE ENGINEERING AND MINING JOURNAL *is projected in the intent of furthering the best interests of the Engineering and Mining public, by giving wide circulation to original special contributions from the pens of the ablest men in the professions. The careful illustration of new machinery and engineering structures, together with a summary of mining news and market reports, will form a prominent feature of the publication.*

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The American Institute of Mining Engineers.

THE concluding session of the August meeting of the Institute was held at the Sun Hotel, Bethlehem, on the afternoon of August 17th.

The meeting was called to order at 2 o'clock P. M., W. R. SYMONS, Vice-President, in the chair. Mr. CORYELL, the Secretary, after calling the roll, said that the following names had been presented to the Council as candidates for admission as members or associates. Those marked M, were candidates for regular membership; those marked A, for admission as associates:

H. Stanley Goodwin,	Bethlehem, Pa. (A.)
Thomas Philipps,	Summit Hill, Pa. (M.)
Andrew Bryden,	Pittston Pa. (M.)
Col. Washington Lee, Sr.,	Wilkesbarre, Pa. (A.)
J. W. Harden,	Philadelphia, Pa. (M.)
F. L. Vinton,	New York, (M.)
Walter Craft,	Columbia, Ala. (M.)
Miers Coryell,	Shanghai, China, (A.)
George H. Parish,	Wilkesbarre, Pa. (A.)
James A. Dinkey,	Mauch Chunk, Pa. (A.)
A. J. Whitney,	Harrisburgh, Pa. (A.)
William J. Harris,	Hazleton, Pa. (A.)
Clark Fisher,	Trenton, N. J. (A.)
John C. Lord,	Port Oram Iron Co., N. J. (A.)
Rufus J. Bell,	Wilkesbarre, Pa. (A.)
D. R. Bennett,	Jenkintown, Pa. (A.)
M. Hewitt,	" " (A.)
H. F. Torrey,	Providence, Pa. (M.)
Harrison Wright,	Wilkesbarre, Pa. (A.)
Henry Newton,	Cleveland, O. (M.)
Z. B. Thomas,	Wilkesbarre, Pa. (A.)
Alfred Curtis Yates,	Mahanoy City, Pa. (A.)
J. H. Bowden,	Wilkesbarre, Pa. (A.)
Thomas Hunt,	Catasaqua, Pa. (M.)
Joseph Hunt,	" " (M.)
Joseph W. Garey,	Pottsville, Pa. (M.)
Stewart M. Buck,	Boston, Mass. (M.)
John West,	Bethlehem, Pa. (M.)
B. West,	" " (A.)
E. P. James, C. E.,	—— (A.)
Charles McMillan,	Bethlehem, Pa. (A.)
Abram S. Hewitt,	New York, (M.)
William Brückner,	El Paso, Texas, (M.)

No objection being made by any member present to the election of any of the gentlemen named, balloting was dispensed with, and the election by acclamation was unanimous.

The next subject discussed was the place for the next meeting: Troy, N. Y., being selected. The next meeting will therefore be held at Troy, on Tuesday, the 21st of November next.

A Committee, composed of R. W RAYMOND, E. B. COXE, and MARTIN CORYELL, was appointed to make arrangements for the publication of such papers as the Council of the Institute may direct, and to secure the necessary means for defraying the expenses attending such publication.

A Committee, composed of GEORGE W. MAYNARD, EDWIN PECHIN, WILLARD P. WARD, SAMUEL THOMAS, THOMAS N. DROWN, and WALTER CRAFT was appointed to report to the Institute on the more economical production of iron in this country. Power to add to its members at discretion was also granted to the Committee.

A resolution was then adopted, tendering the cordial thanks of the Institute to Mr. E. B. WEBSTER, President of the Lehigh Zinc Company, and to the Superintendents of the different branches of the Company's works, for their attentions and hospitality during the visit of the Institute at Bethlehem. Thanks were also tendered to the officers of the Bethlehem Iron Company.

The President laid before the Institute the letter of President COPPÉE, of the Lehigh University, offering to the Society a room as a permanent depository for their plans, collections, etc., and for use as a place of meeting. The letter was received with a vote of thanks, but it was deemed best to defer the consideration of the subject till another occasion.

Mr. ROTHWELL then read a paper upon professional morality, which will be found in another place.

Mr. MAYNARD made some pertinent remarks upon the applicability of anthracite-iron for the production of Bessemer metal. He detailed facts and recounted practical observations made by himself, which led to considerable discussion and inquiry.

Mr. ROTHWELL read a paper on the difficulties in the identification of coal-beds, an abstract of which will be found elsewhere.

Mr. CHARLES BROADHEAD invited the members of the Institute to visit the Chapman slate-quarries in Northampton county, but the kind invitation was necessarily declined, on account of the lack of time.

The Lehigh Coal and Navigation Company extended to the Society an invitation to visit their works at Mauch Chunk and Summit Hill. Owing to the length of time that the members had been kept away from their regular business, but few of them felt able to accept the invitation. An account of the trip of those who went will be found elsewhere.

The American Institute of Mining Engineers now has upon its roll the names of 115 active, working, intelligent and progressive members. Their influence for the good of the profession must be great.

The Indianapolis Meeting of the American Association for the Advancement of Science.

THE twentieth annual meeting of the American Association, held in Indianapolis on the 16th inst., has become a thing of the past. Perhaps a more brilliant and successful meeting of scientists has never been held in this country. The address of the retiring President, Dr. T. STERRY HUNT, on the "Geognosy of the Appalachians and the Origin of Crystalline Rocks," was admitted to be very able, and to embody a great deal of original matter derived from the personal observation of the author. We hope on a future occasion to be able to reproduce extracts from this address, in our columns. The address, neatly printed in pamphlet form, has already been received.

We are so much crowded for space this week by the proceedings and papers from the Bethlehem meeting of the Institute of Mining Engineers, that much interesting matter from the American Association is necessarily omitted.

The Engineers' Trip to the Switchback Road and the Nesquehoning Tunnel.

THE members of the American Institute of Mining Engineers were met by Messrs. STEARNS & J. DUTTON STEEL, a car being provided by which they were taken around the "Switchback" to the Coal Breaker, in which the new process of separating the slate from the coal by water and machinery instead of hand-labor is now successfully being effected by "Jigging under a body of water," by which method all the coal is floated and scraped into a proper receptacle, and the slate and dirt, passing through peculiar valves, is disposed of in the ordinary way; and so complete and labor-saving is the process, that the company, under the directions of Mr. STEARNS, is erecting near the canal a much larger and more effective machine. The principle upon which these machines operate is not essentially different from those used in the dressing of metalliferous ores.

The machine, plant, and details were most fully explained by those in charge.

The Nesquehoning Tunnel, to be made through the mountain from the coal valleys of Panther Creek into the valley of Nesquehoning, was next visited It is fast approaching to completion, under the direction of J. DUTTON STEEL, and by the aid of the Burleigh drill, operated by compressed air, nineteen drills, mounted and worked from four separate carriages or trucks, are always ready, and thirteen drills of the number constantly at work. Three thousand two hundred and ten feet of heading from the south or Panther Creek side had been driven, and four hundred and twenty feet from the north or Nesquehoning side, and there are one hundred and seventy feet yet to drive to bring the work together, which will be accomplished in another month.

The care and detailed attention that Mr. STEEL has given to all the facts connected with this undertaking are worthy of the highest praise, and possess a value not to be over-estimated.

On the completion of the work, we have the promise that the public, and, of course, our Society, shall have a statement which will designate the number and depth of holes drilled in the conglomerate and shale rocks, and the quantity of powder used, the cost per inch of drilling, and so with all the work in detail, and with this assurance we anxiously await the speedy completion of this important work, to enjoy with the company the advantages and pleasure of such a heavy and well-matured undertaking.

The Wire-Rope Factory of the Hazard Manufacturing Company, and the Foundry and Machine Shops of SALKELD & Co. were visited, where we received the attention of the proprietors, and, making our meeting, as a body without officers, at the sumptuous table of the Mansion House, the termination of the second session of the American Institute of Mining Engineers we fondly trust that future unions will afford equal information and enjoyment.

MINING SUMMARY.

California.

We are indebted to the San Francisco *Bulletin*, of August 11th, for the following account of a visit to the

AMADOR MINE:

SUTTER CREEK, August 1, 1871.

Through the kindness of General COLTON, Vice President of the Board of Directors, and Mr. STEINBERGER, Superintendent of the mine, we were permitted to descend into the Amador mine on Monday last, for the purpose of inspecting the immense underground excavations. This mine is situated on the great mother lode, which extends through Amador to Calaveras and Mariposa counties, and has been in active operation for nearly twenty years. The surface-workings overlook the quiet little city of Sutter Creek, which is located in a basin beneath, surrounded on all sides by an unbroken circle of hills. It is upon the Amador mine that this place is most dependent for its support.

THE NORTH SHAFT.

Entering the dressing-room we were furnished with a suit of miners' working-clothes from among the many that were to be seen hanging on the walls all around, and at once proceeded to descend the north shaft. This shaft, it will be remembered by those interested in mining matters, was destroyed by fire, in May last, the same lasting thirteen days. The repairs are now nearly completed. The shaft, as it now is, is much larger than it formerly used to be. It is now twelve feet long, lying in the same manner as the vein runs—north to south—and embracing the entire width of the lode. The timbers employed for lining it are all square-sawn, measuring twenty inches in diameter. These timbers are placed at a distance of five feet apart, from centre to centre. Stout planking is used to support the foot-wall, which is a soft, rotten slate. The hanging-wall being granite, needs no such support. This shaft is again sub-divided into three compartments, in two of which patent cages will be employed in hoisting ore, instead of the iron buckets now in use. Entering a large iron bucket, three of us descended in charge of W. JONES, the foreman. We soon discovered that the shaft is nothing more or less than an immense under-ground incline, as it follows the dip of the vein,—from west to east, at an angle of about seventy-five degrees.

BELOW SEA-LEVEL.

For several hundred feet down the lode has been completely exhausted. The present working levels are named after the principal stations on the way to N. York, the first being named the "Latrobe;" the second "Folsom;" the third, the "Sacramento;" the fourth, "San Francisco;" and the fifth, or lower level, "Panama." By these various names they are all known and readily distinguished. Our transit from the surface to "Panama" level, a distance of 1,250 feet, occupied about fifteen minutes time. To raise ore from this level only occupies about one minute. This is the prospecting level in the mine. At present, the vein measures twelve feet in width, and yields an average of about $10 per ton. Although "Panama" level is some 150 feet below the level of the sea, it is proposed to sink 200 deeper in the course of a few weeks. It is now the deepest excavation in search of gold, existing throughout the world.

DRAINAGE.

The Badger or South Shaft is used for draining the mine. Large iron cylinders of about twelve feet in width, having a carrying capacity of 300 gallons, are used for that purpose. These are hoisted by means of steam-power at the rate of one per minute. During the summer season the mine is kept quite dry by running eight hours only of the twenty-four. In the winter or wet season the increased amount of water forcing its way into the mine, usually compels them to abandon the lower levels.

DANGER.

Every possible precaution is taken to insure safety and to prevent accidents occurring, nevertheless, I am informed that as many as thirty-eight men have been killed since the opening of the mine, a proportionately large number having been injured also.

THE MILLS.

The ore, as extracted from the mine, is at once conveyed to the mill, situated at a distance of about one quarter of a mile from the shaft. This mill contains seventy-five stamps, forty of which are usually employed when the mine is in full blast. At present, twenty only are at work, inasmuch as there are only forty miners engaged in the underground excavations. It is here that an average of about two thousand tons of ore per month undergoes a thorough reduction, yielding an average of about $22 per ton, or an aggregate of about $45,000 per month. Previous to the present proprietorship, the reduction of the ore was very much neglected. The concentration of sulphurets was altogether disregarded, and they were allowed to escape. Hundreds of thousands of dollars have thus escaped into the bed of Sutter Creek, and are now probably irrecoverably lost. The concentration of sulphurets is now carefully attended to, and the gold extracted from them brings in a large revenue, yielding at the rate of $100 and upwards per ton. All the sulphurets saved at the various mills in the neighborhood are reduced at the Chlorination Works of Messrs. JONES & BELDING. The yield of the sulphurets of the various mines ranges from $90 to $130 per ton.

The Alpine *Miner* has the following article on

ALPINE COPPER.

The copper interest of Alpine is looming up into great importance, and the future is full of promise for these mines that have heretofore been looked upon as comparatively worthless from the preponderance of this metal. To the efforts of Professor RICKARD to profitably utilize the Leviathan ore, are we indebted for the demand for this class of ores. Upon the failure of their attempt to smelt Leviathan ore he began to look for some other profitable source in which to consume it, and succeeded in finding a market at the works of BIRDSALL & Co., in Dayton, where they were engaged in the manufacture of sulphate of copper for home consumption. It has been proved at this Dayton manufactory, that, where a supply of copper could be obtained within a reasonable distance of Virginia, the demand for bluestone can be supplied at such rates as to partially exclude the imported article. The success of BIRDSALL & Co. in the profitable production of this indispensable article for the reduction of silver ore, has stimulated a healthy desire on the part of others to engage in its manufacture. On Monday of the present week, Mr. BOUSFIELD, assayer to the Bank of California in Virginia, paid Monitor a visit in search of a supply of ore with which to engage in the manufacture of bluestone, at Carson. It is his intention to erect works of the capacity of 100 tons per month, for which amount he now has a contract. He visited both the Globe mine and the Leviathan, and has made such arrangements as will justify the immediate erection of his works. He returned to Virginia on Thursday, where his plans will be definitely arranged and work commenced, when he will again visit this locality for further investigations. There are several other mines of equal promise as the Globe and Leviathan, for a supply of copper, and we expect to see, before winter sets in, work upon some of them commenced, and to be prosecuted with vigor until the owners are rewarded for their exertions.

ALTONA GRAVEL-MINING COMPANY.

The Grass Valley *Union*, of August 12th, says: We mentioned a few days since that the Altona Gravel-Mining Company, of Alta Hill, intended sending from their mine a few tons of their upper and lower strata of gravel to the Gold Hill mill as a test of the value of the gravel in each stratum. Ten loads of the lower stratum were crushed and cleaned up yesterday, and the yield is $10 to the load. This yield exceeds the expectations of the Superintendent, and gives the most gratifying assurance of the richness of the company's mine. The gravel from the upper stratum will be cleared up to-day, when the result will be announced.

NEW GOLD MINE.

From the Los Angeles *News*, of August 1: A very rich vein of gold-bearing quartz has been discovered in the vicinity of Fort Tejon, by J. R. TREADWELL. The ledge is eight feet wide, and work has already been commenced upon it, three arastras having been set up. A mill is to be erected at an early day, and it is the intention of those interested thoroughly to develop the new strike. This but affords an additional instance of the extent of the mineral resources lying latent and undeveloped in Southern California. New discoveries made from time to time reveal the natural wealth of this region.

Colorado.

From the Colorado *Miner* of August 12: The Stevens mine, at West Argentine, still continues to produce a goodly quantity of first-class ore. The tunnel driving to the vein is now in close proximity to it. On the Hercules mine, Brown mountain, a drift is being run to connect the two shafts, in order to secure ventilation. Some little ore is being obtained from the drift. The remarkable deposit of ore in the slide near the Equator mine is not yet worked out, and still continues to give employment to several miners, who find their labor highly remunerative. The west portion of the Snow Drift is yielding large quantities of first-class milling ore. There is now in one place in the mine eight inches of very rich ore that assays 326 ozs. in silver per ton. JAS. CALLERY is working the Cashier lode, at Empire, and has a fine body of iron pyrites, of about two feet in width, worth from $80 to $120 per ton. It is a big thing, and Jim is deserving of it. The Equator is being actively worked, and preparations are being made to develop it on an extensive scale. It is one of our very best mines, at one time the most productive, and we have no doubt but that its early reputation will soon be realized again. The Nyanza, Democrat mountain, is opening out rich. There is now in sight 10 inches of ore at a depth of only ten feet from the surface. The ore yields from $50 to $300 per ton in silver. Boys go to work on your old discoveries, you want the silver they contain, and the government is sadly in need of the bullion to pay off the national debt.

Activity in mining affairs still continues here, and a general good feeling prevails regarding the present and future prosperity of our mining interests. Our mills are full of ore, for which they are paying higher cash prices than at any other point on the continent. The people of Clear Creek county, and especially of this section, have just cause for rejoicing, and we can say, safely, that another season will witness a farther increase in the schedule of prices, thereby insuring another great benefit to the miner. The Stewart Silver Reducing Company have purchased, since our last issue, six lots of slide ore, averaging from 413 to 880 ounces per ton; nearly a ton from the Ruby lode, Daily District, which milled 175,75 ounces, or $227,38 coin per ton: also, ore from the Alabama, Prince Albert, Phœnix and Terrible. They have shipped, being the first bullion produced from the Arey furnace, which they have just got into operation, $2700 coin. Within thirty days the bullion shipments will be largely increased. In this connection we will say that the Arey furnace Company now guarantee that their furnace will work one ton of ore per hour, and chlorodize 85 per cent. of the silver. Thus another advance is made in the progress of our material industry. The Marshall tunnel has reached a distance of about 1120 feet. The Burleigh tunnel is still being pushed ahead, and has reached a distance of about 1145 feet. The Compass and Square, one of our oldest discoveries, and in 1867 one of our most productive mines, is again being worked, with remarkably good results. The mine has been always noted for the extremely rich ore which it produced, and the ore now being obtained in no way detracts from its early reputation. At a depth of fifty feet in the shaft a drift east is being run, in which the ore vein is larger and more productive than in any other portion of the mine that has been worked. The average assay of a lot of ore, not selected, by the ton, is 650 ounces, $835,51 coin, and of a lot partially, not closely selected, 945,5 ounces, $1222,53 coin per ton. Good enough.

PALMER & NICHOLS have again had a small run, owing to breakages. The mill is nothing but a rattle trap at best, with neither shaft or pulley of sufficient strength to do the work allotted to them. In justice to the present proprietors we desire to say it was not erected by them. Their bullion shipments for the week are Bar No. 389, 1352,60 ozs., 952 fine, coin value $1664,92. Among the several lots of ore purchased by them we noticed 1024 lbs. Coney, assay value 60.5 ozs.: 1576 lbs. Rip Van Winkle. 212 ozs.; 1947 lbs. first-class Horrible, 388 ozs., and 2246 lbs. second-class ore, 153 ozs.; 1541 lbs. Cynosure, from Chicago Creek, 271 ozs.: 1200 lbs. Seymour, 149.5 ozs., and 904 lbs. Rob't. E. Lee, 317 ozs.

The same paper contains the following:

SUMMIT COUNTY ITEMS.

Owing to the small amount of snow that fell during the past winter, and also to the scanty rain of the summer, the placer mining season of Summit county for 1871 has not been as prosperous a one as could be wished. The supply of available water has been much less than in average years and, as a neccessary consequence, the amount of bullion produced has been less than usual. In Hoosier gulch, in the extreme southeastern end of the county, Bemrose & Co have been mining with good results; their operations are being carried on in an old channel and the ground is rich. Near the mouth of Hoosier, EMMET & Co. are putting in a flume; their ground prospects well and when the main channel is reached this ground cannot fail to return highly remunerative results. In French gulch about the usual amount of mining has been done. GEO. DAY is running his ground sluice in the gulch and is taking out good pay. JAS. TODD has about reached pay with his flume and during the next season will doubtless resp a harvest of golden "nuggets" and "dust."

In Lillian Vale, CHAS. BLAIR is running a flume with good results, and an excellent prospect for a "good thing" ahead. Messrs. MOWERS & HANGS, and also Mr. SISSLER are mining below Lincoln City and are taking out good pay. New Stillson Patch, the ground formerly owned by JAMES MCFADDEN, but now the property of a St. Louis Company, is being mined under the superintendency of Mr. J. KELLY, an old Californian of experience and ability. This ground is rich and is paying well. Below the McFadden ground is the property of the Genl. Grant M. and Sluicing Co., a Summit county enterprise. This Company own a large area of territory, 9900 feet in length by 800 feet in width, all of which ground contains first-class pay. The flume is now nearly 2000 feet in length, with a good dump into Blue River, and is a substantial structure. The bed of the old channel has not been reached, the flume being but on the edge of the rim. The pay taken out is most excellent and is rapidly increasing. There can be no doubt but that this Company have possession of as good ground as any in the county, and it is very certain that the energy and skill displayed in the working of the same is to be richly rewarded. GREENLEAF & Co. are driving ahead with their work on their several properties with good results. In Humbug and American gulches the small amount of water has caused a suspension of mining, and the former named gulch has passed into the hands of Mr. GREENLEAF, who is preparing to bring in a large ditch from Swan river. The ground in the upper end of the gulches is uncommonly rich and the water for sluicing is all that is neccessary to insure good returns. In Gold run and Galena gulch the usual amount of mining is being done with about average results.

Salt Lick gulch is panning out well and the "clean ups" are thoroughly satisfactory to the owners of the ground. Several large ditches are being surveyed, which when completed, will furnish an abundant supply of water to localities known to be rich but at present unworkable. The process known as "booming" is being adopted in the county with good results, and many gulches that would not pay to ground sluice with a scanty supply of water are now being profitably worked.

BOSTON SILVER MINING ASSOCIATION.

This stanch company of capitalists, Col. WILLIAN S. CHANDLER, superintendent, are working one hundred men at St. Johns, Snake River Mining District. The Comstock mine is situated on Glazier mountain, and has frequently been described in the *Miner*. There are 1200 feet of stoping ground in the mine, and 1500 tons of good milling ore mined out. Capt. WARE, the mine master, informs us that the mine is capable of yielding 20 tons a day. The tram-way, a substantial one, is so constructed that the ore can be delivered from the mine into the mill. We have been conversant with the workings of the Comstock since its discovery and can assure our readers that the vein has improved in all its workings from the surface to its present depth of 260 feet. The Company are erecting a mill of twenty tons capacity a day for the treatment of ore by smelting and amalgamation. The engine and Harrison boiler has a capacity of 100 horse power, and is a model of strength and workmanship. The machinery and material are on the ground and the erection of the mill is proceeding at a rapid rate. When the mill is completed the *Miner* will give to the public a full description of it and all the workings of the mine.

NAPOLEON AND SILVER WING.

This property owned and worked by the St. Lawrence Silver Mining Company, was organized by J. T. GOODRICH, Esq.. a gentleman who has formed several wealthy companies on first-class mining property in Colorado. These mines outcrop on the north face of Glazier mountain, and are worked by levels driven in on the veins. The ore from the veins will be delivered in the mill which the company are now constructing and will soon have completed, at slight cost, by a tram extending from the mines to the mill. The mill, when completed will have a twelve stamp Howland battery, Wheeler amalgamating pans and an Arey furnace. Everything is under the management of W. T. WITHERELL, the Superintendent, and is in a forward state of completion. The mining property is first-class and we are glad to say that the management is of that order that will insure success to all parties concerned.

CHATAUQUA.

This mine, owned by JOHNSON & TELLER, and GILBERT H. BULL, is situated on the north face of Glazier mountain, and was discovered by Mr. BULL in 1865. The shaft is now 40 feet in depth, disclosing a splendid vein 6 feet in width between solid, permanent walls. The gangue of the mine is Jeffersonite and gray quartz. There is no vein of solid ore, from 4 to 5 inches in width, and from 10 to 24 inches of gangue and ore combined. The ore is galena, blue carbonate and gray copper, the latter in abundance, and gives an assay of $936,78 coin, per ton In the immediate vicinity of the mine there is an abundance of excellent timber, and in fact, everything required for the safe and economical working of the property.

Nevada.

STRIKE IN THE LANE AND FULLER SHAFT.

From the Reese River *Reveille* of August 14th: It is with pleasure that we record the strike last week of a magnificent body of ore in the 550-foot level of the Lane and Fuller shaft, the property of the Pacific Mining Company Limited. The vein struck is the Buell North Star ledge, and is 1,050 deep from the mouth of the old incline, with which it is connected. It is in entirely new ground, and no deception need be feared on account of old works. The same company have struck a new vein of rich ore, fifteen inches thick, in one of the cross-cuts in their lowest level, and their success appears to be now beyond doubt. Mr. HENRY SEWELL is of the opinion that the mine will justify the starting of the company's mill (the Metacom) at an early day, which, we are sure, will be as welcome news to our people as it will be to the stockholders in London. In the meantime he has made arrangements with the Manhattan Company for the reduction of a large quantity of ore which is now accumulating beyond the capacity of the ore house. Captain PRIDEAUX is also entitled to credit for his unremitting zeal.

A WILD CAT.

A real, veritable wild cat has made its appearance on Union Hill. For years past the "varmint" has been so scarce in these mountains that we all thought the last specimen of the species had followed the great exodus to White Pine, and had emigrated thus to Eureka and other new places, never to return to Austin. But we were all mistaken. A cunning old cat has just emerged from his lair at the bottom of the Toiyabe shaft, and is now rampant over the hills, seeking whom it may devour. To speak more plainly, a huge swindle is attempted to be perpetrated in London by some individuals who have the manipulation of the Toiyabe Silver Mining Company. A friend has handed us a copy of the London *Mining Journal* for July 22d, in which a prospectus appears, which, for "cheek" and mendacity has seldom been equalled. We will "go for" the aforesaid cat in a day or two, or as soon as we can obtain the facts in the case. Mr. CURTIS has promised us the returns of the few batches of selected ore which the Toiyabe Company had worked at the Manhattan mill, and when we get them we will tell the retired grocers of London, who yearn to invest their earnings in dividend-paying concerns, what the Toiyabe Silver Mining Company is.

Utah.

We make the following extracts form the correspondence of the Salt Lake *Tribune* of August 12th.

BINGHAM DISTRICT.

After one year's test I am well satisfied with Bingham Canyon as a most reliable and solid mineral district. What was only theory with me one year ago is to-day a demonstrated fact, viz: that the West Mountain mining district and all other districts in the same geologic line are in the very *core* and *heart* of the great upheaval traversing the mountain territories from northeast to southwest—reaching in extent many hundreds of miles; that in this core the granite and quartzite rocks prevail in which the largest, best-defined and most reliable true fissure veins will be found.

The vast deposits of mineral exposed by excavations in the mines of Messrs. BUEL, BATEMAN & Co.,—in the Spanish mine, owned by the Messrs. DIXON & Co., and in the still greater deposits developed by excavations in the old Jordan claim, demonstrate if the very rich chlorides are not found in Bingham, that ores of fair grades are found in such quantities that the work of generations to come cannot exhaust them. The mineral veins in this district crop out so strongly and are so clearly defined that locators do not squat down within twenty-five feet of each other and thus lay foundation for interminable lawsuits. The rich chlorides do not crop out here in seams, pockets and pools, at the surface so as to tempt that class who "neither fish nor cut bait" to jump titles and hold "fighting interests" with Henry rifles and revolvers.

The Yosemite mine owned by Messrs. MAY & MERRILL, has a shaft sunk on it to the depth of 196 feet. They have a clearly defined fissure vein four feet in width, filled with ore assaying about 60 per cent lead and from twenty to thirty ounces silver per ton. The Winnemucca mine worked by Messrs. DAGGART & BRISTOL has been explored to the depth of 318 feet, on the varying dips of the lode reaching a vertical depth of over 200 feet. They have a vein of ore seventeen feet in thickness, ranging in value from fifty to sixty ounces in silver per ton, indeed I hear rumors of much higher figures having been obtained from ore taken from this mine.

The Kelsey Tunnel company are running a tunnel to reach eight mineral veins that they own, that are all within the distance of one thousand feet of the face of their tunnel. They have already crossed two of them, one being over nine feet in thickness, but so decayed by the action of water at the point of intersection, that they have not deemed it wisdom to work it at present. This tunnel is now over 260 feet in length, reaching a vertical depth of over 300 feet. All the present indications go to prove that they are now in the neighborhood of a very large mineral vein. I think that time will prove that tunneling through high ridges traversed by large mineral belts, thus cutting the veins at right angles and at great depths, is the most effectual and profitable system of mining.

Messrs. FLIESS, ALLEN & MOODY of New York city and your correspondent are also working two locations, the Fliess and the Miner's Home, which give promise of becoming paying institutions, as the veins are very large and the ore of good grade. There are a large number of claims being worked very effectually besides those mentioned, which give indications perfectly satisfactory to their owners, but as this article is designed as an advertisement for Bingham Canyon and not for individual cases, forbear making further mention of special mines, special assays, etc., etc. The demand for laborers is fully equal to the supply, and there are no men idle in Bingham for want of employment. The next largest sum obtained for any mine in Utah to that brought by the Emma, is the one received by DUEL, BATEMAF & Co., from London capitalists, for their claim. Several other sales have been made of late that have given quite an impetus to business.

SMELTING.

I hear that the purchasers of the BUEL & BATEMAN mine intend to erect three furnaces in addition to the one they now have in operation, which has already turned out a large amount of bullion. Messrs. DAGGART & BRISTOL have at last succeeded in finding the proper fluxes for their ores, and their large furnace is now in very successful operation. Their bullion runs from 30 oz. to 130 oz. of silver per ton. They design, I am informed, to put up another furnace as soon as possible.

THE GOLD PLACER

of Bingham has always been a source of rich supply to the camp. Messrs. HILL & CLAY and Messrs. WATSON & Co., are preparing to work the bed rock of the main gulch. The former by shafts, engine and pumps, and the latter by a drain tunnel. Enough is known of the richness of Bingham gulch by those most conversant with the district, to enable me to predict a very rich return to those gentlemen for their outlay of labor and means.

TINTIC DISTRICT.

Among the various mining districts which I have visited this is justly entitled to as high a consideration as any. It embraces the three mining towns of Eureka, Silver City, and Diamond, all thriving settlements that are destined to flourish for the future. Eureka City is supported now mainly by the wealth of Eureka hill, as the Eureka Company alone employ a large number of men in the development of their magnificent property, in running tunnels and drifts, sinking shafts, assorting ores, etc., and there are hundreds of other miners on the hill who are as busy as bees in the development of their claims. The mines on this hill are all in limestone, which has been, and perhaps still is, regarded as rendering the continuance of the mineral veins extremely uncertain, by reason of which outsiders have recklessly taken possession of portions of numbers of ledges included in prior claims, gone to work, extracted the richest ores, and defied the prior claimants to establish their title, but many of these jumped claims will, undoubtedly, follow the fate of poor "King David," poor only in the sense of the utter humiliation of being absorbed by the *bona fide* title of the Eureka company. The appearance of Eureka Hill suggests a comparison to a honey comb, but from which the honey has been only partially extracted. Leaving this hill (upon which there are at least one thousand tons of ore upon the various dumps) the only other mine in this section of the district is located on an adjoining hill and belongs to Messrs. PEACE, BOYD & TAYLOR, and known as the Wyoming. These gentlemen seeing the difficulties with which the original claimants of Eureka Hill have had and still have to contend, by leaving such long stripes of their various

ledges untouched (thereby leading wandering prospectors into the strongest temptation,) have adopted the wise policy of sinking a sufficient number of shafts to so hedge in their claims as to preclude the possibility of their being jumped. And by adopting this course they have also proved the great extent and value of their mines, as well as having secured its complete possession. The ore of the Wyoming, as well as the ores of the mines of Eureka hill, are milling ores. There are about 500 tons on the Wyoming dump. The next town to Eureka is Silver City, and although only at a distance of four and a half miles, the formation of rock is completely changed.

In the vicinity of this town (Silver City) all the mines are in granite and porphyry,—a most excellent indication to experienced miners, who doubt the permanency, if not the wealth, of mines in limestone. The Sunbeam lode, about a mile and a half from the town, is the most prominent and to-day the richest lode in the district, and if well-defined walls in granite and porphyry are favorable indications of permanency, its further development will undoubtedly make it rank with the best mines in the Territory, or in the country. A number of shafts have been sunk to the northwest, and in the same mineral belt. Then there are the Shoebridges, Morning Glory, Susan, and a large number of other mines, all worthy of special comment as well-defined leads, and as yielding an excellent quality of ore.

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NEW YORK, Aug. 23, 1871.

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U. S. PATENT OFFICE,
WASHINGTON, D. C. June 26, 1871.

On the petition of J. D. WEST of East Orange, New Jersey, praying for the extension of a patent granted to him on the 29th day of September, 1857, for an improvement in pumps. It is ordered that the testimony in the case be closed on the 29th day of August next, that the time for filing arguments and the Examiner's report be limited to the 8th day of September next, and that said petition be heard on the 13th day of September next.

Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

U. S. PATENT OFFICE,
WASHINGTON, D. C. July 15, 1871

On the petition of DELOS W. GITCHELL of Newburgh, New York, and LUTHER W. BADGER of Elizabeth, New Jersey, praying for the extension of a patent granted to them on the 2nth day of October, 1857, for an improvement in manufacturing Seamless Felt Garments. It is ordered that the testimony in the case be closed on the 19th day of September next, that the time for filing arguments and the Examiner's report be limited to the 29th day of September next, and that said petition be heard on the 4th day of October next.

Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

U. S. PATENT OFFICE.
WASHINGTON, D. C. June 23, 1871.

On the petition of WILLIAM PLUMER of Boston, Mass., praying for the extension of a patent granted to him on the 5th day of October, 1857, for an improvement in Rock Cutting and Drilling Machines. It is ordered that the testimony in the case be closed on the 5th day of September next that the time for filing arguments and the Examiner's report be limited to the 15th day of September next, and that said petition be heard on the 20th day of September next.

Any person may oppose this extension.

M. D. LEGGETT, Commissioner.

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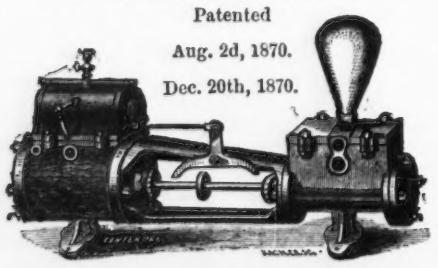

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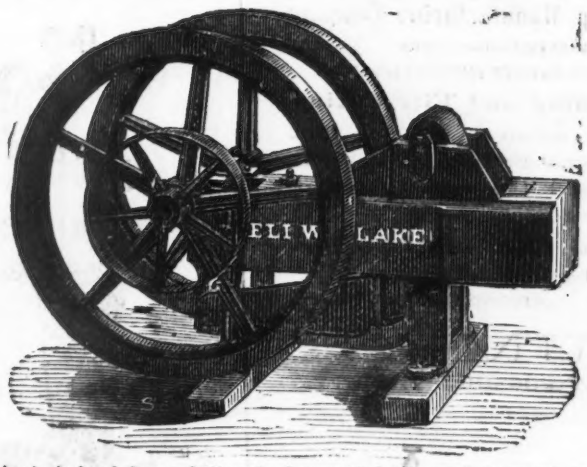

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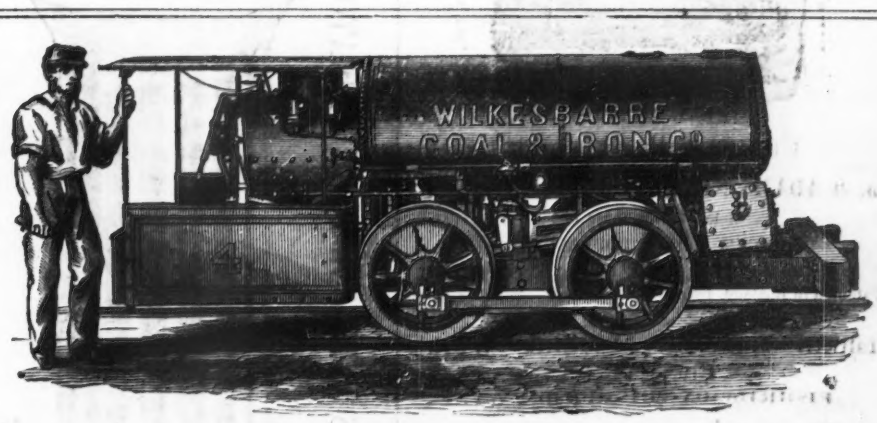

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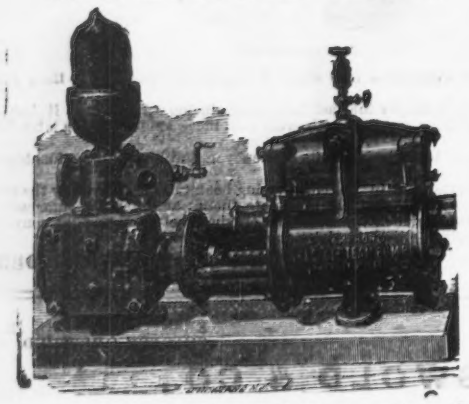

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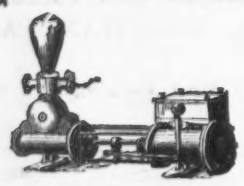

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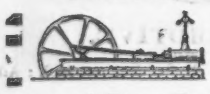

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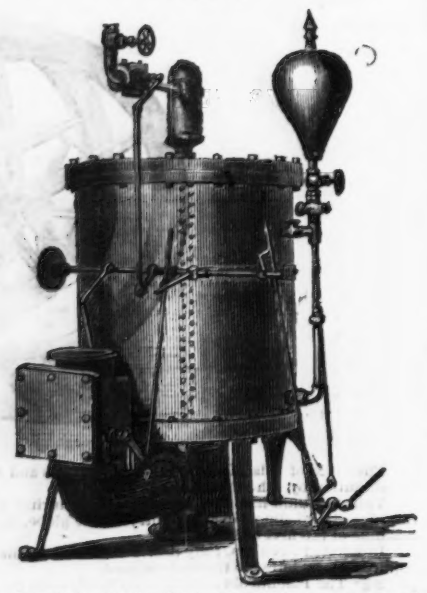

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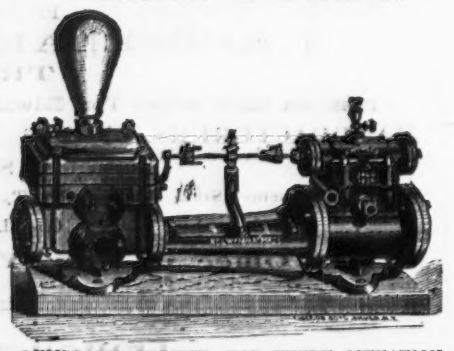

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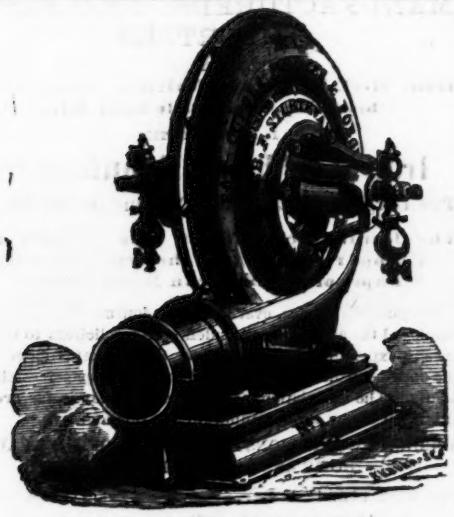

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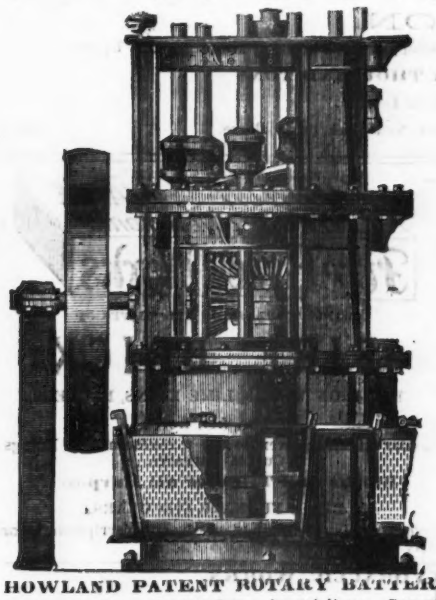

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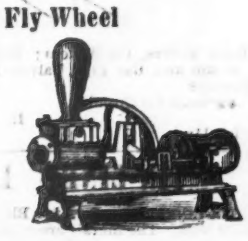

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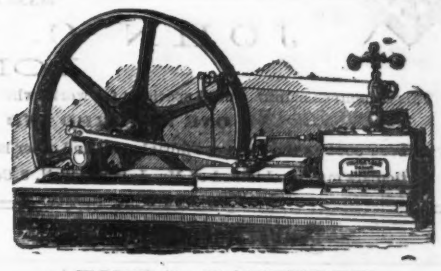

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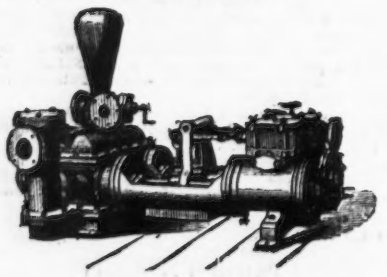

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